IMAGES OF WAR

HITLER'S ANTI-TANK WEAPONS 1939–1945

RARE PHOTOGRAPHS FROM WARTIME ARCHIVES

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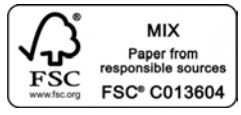

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Introduction

An anti-tank gun is an artillery weapon primarily designed to destroy armoured fighting vehicles, normally from a fixed defensive position. The Germans were masters of anti-tank gun warfare, and during the Second World War developed a variety of specialised anti-tank munitions and anti-tank guns. This book, in the popular 'Images of War' series, is dedicated to the men and the guns that fought in the anti-tank war. With rare and unpublished photographs, accompanied by detailed captions and text, the book covers all the various PaK guns from the 3.7cm PaK 35, 5cm PaK 38 and the 7.5cm PaK 40, to the versatile 8.8cm FlaK guns, and the vehicles that pulled these weapons including the specialised forward observers and reconnaissance elements.

As the war progressed, the ever increasing demands on the German war machine required drastic changes in anti-tank warfare. This included mounting PaK guns on halftracks and converted Panzers and turning them into fast mobile tank-killing machines or Panzerjäger (Panzer hunters). This led to further development in anti-tank guns, and to more economical weapons that were deadly and efficient such as the hand-held anti-tank weapons including the Panzerfaust and Panzerschrek, which were used in all the theatres of war. The Panzerfaust was used extensively in the last year of the war, and with its unique shaped-charge warhead could penetrate the armour of any fighting vehicle. After firing, the tube was discarded, making the Panzerfaust the first disposable anti-tank weapon in history.

This book provides a unique overview of German anti-tank gun warfare from action in Poland, the Low Countries, France, Italy, and the Eastern Front, up to the last weeks of the war. This highly illustrated record of the firepower of the Nazi war machine is a must for anyone interested in weapons of war.

Chapter One

Early Years 1939–41

With the introduction of thicker-armoured heavier tanks being manufactured around the world, German weapon designers in the 1930s worked to produce a light weapon that could be towed, moved, concealed easily and with the fire power to deal with enemy tanks if the country was ever to go to war. As a result of this, anti-tank weapons, or 'Panzer Abwehr Kanone' (PaK for short), were designed and manufactured. Just as important was that these guns possessed a projectile with high velocity ammunition that could pierce enemy tanks at a reasonable range and halt their progress on the battlefield.

When war finally broke out in September 1939 and Germany invaded Poland, the attack was a surprise for the Polish enemy. While bombers and fighter planes soared overhead, reconnoitring, attacking, spreading fire and fear, Panzers, whole divisions of them, sped across the countryside, accompanied by infantry of 1.5 million men on horses and in motorized columns. Among this arsenal were the anti-tank PaK units.

It was here that the Germans introduced their first anti-tank gun, the 3.7cm PaK 35/36. This was the standard German anti-tank gun at the outbreak of war. By design standards it was small but rugged, well-engineered and reliable. The gun was of conventional type and was carried on a two-wheel split-rail carriage of tubular construction with a bolted-on sloped armoured shield. A hydro spring recoil system was carried in the cradle and the wheels had coiled springs.

During the invasion of Poland the Germans fielded some 11,200 of these guns, and the gun proved more than adequate against lightly armoured opposition in spite of having a disappointing penetrative performance. Many of the PaK units were towed by animals, and while this mode of transport was relatively slow, resistance was not a major threat and PaK units had considerable freedom of movement on the battlefield without much danger of being overrun.

The Germans also had a small number of anti-tank rifles. These dated back to the First World War with the Mauser 1918 T-Gewehr, the world's first anti-tank rifle, created in response to the appearance of British tanks on the Western Front. By the 1930s development resumed in an effort to provide infantry with a man-portable

lightweight anti-tank rifle. First produced was the Panzerbüchse 38 (PzB 38). Only a small number were built in 1939 with sixty-two used by German troops in Poland. A modified version of this anti-tank rifle also saw action in Poland that September, the Panzerbüchse 39 (PzB 39). The weapon was virtually identical to the PzB 38 but slightly longer and lighter. Performance was basically the same as that of the PzB 38, and 568 were used by the German army in the invasion of Poland. Success rate against lightly armed Polish opposition saw the Panzerbüchse make a number of successful engagements, but it was still far from adequate against heavier armoured-plated vehicles.

Following Poland's defeat in early October 1939, plans were soon drawn up to attack the Low Countries and France. For the attack, and to support a typical German division during its advance, there was now the anti-tank battalion, which contained a heavy MG34 machine gun company equipped with twelve 2cm FlaK; and three anti-tank gun companies, each equipped with twelve 3.7.cm PaK 35/36 guns. Also there was a single company of ten 8.8cm FlaK 18 auf Zugkraftwagen. These 8.8cm flak guns were mounted on the chassis of an armoured Sd.Kfz.7 half-track to oppose the thickly armoured British Matilda and French Char B tanks.

While the attack in the West was a complete success, PaK crews quickly learnt how inadequate the PaK 35/36 gun was against the French and British heavy tanks. The enemy were able to defend their positions longer and score a number of sizable successes, much to the frustration of the Germans. It was still effective against the most common light tanks, such as the French R35; and the Char Bs and Matildas represented but a small part of the total number of armoured vehicles in operation in the West; but it clearly needed improvement.

To defy the heavier Allied tanks the Germans adapted a number of their Panzers turning them into the Panzerjäger. The first anti-tank destroyer to see action mounted a Czech Skoda 4.7cm PaK(t) anti-tank gun mounted on a Panzerkampf-wagen I 'ohne Turm' on a converted Ausf.B chassis of a Pz.Kpfw.I tank. In total some 200 of these converted tank hunters were adapted. A five-sided open-topped gun shield was bolted on the top of the chassis to protect the main armament and the crew, and the anti-tank gun was fixed on a platform in a fighting compartment. The vehicle was capable of carrying seventy-four anti-tank 10 HE shells. Reliability in all conditions was regarded as fairly good and combat effectiveness was unusually high, but still its main gun was very bad at dealing with more heavily armoured vehicles. Then again, the enemy had still failed to field many heavily armoured vehicles, so it was not a great problem.

On the battlefield the Panzerjäger I was generally organized into nine-vehicle companies, with three companies per battalion. During the French campaign, anti-tank battalion Panzerjäger-Abteilung 521 had only six vehicles per company, but was also used by independent anti-tank battalions. In total five Panzerjäger companies were

equipped with a 4.7cm PaK Pz.Kpfw.I. In France this vehicle provided ample mobile anti-tank support for the infantry divisions. Throughout the Western campaign the Panzerjäger fought with distinction and supported the infantry extensively throughout with little hindrance to the speed of advance.

By the end of the campaign the PaK 35/36 paled into insignificance. It was recognised that heavier more powerful PaK guns were required and that fast moving mobile anti-tank guns modified on the chassis of obsolete Panzers and turned into tank hunters should become an integral part of the anti-tank arsenal. These were now vital to assist in the penetration of enemy positions and support the infantry in offensive roles against enemy tanks. Russia would play a decisive role in determining this fact.

During a training exercise in mid-1939, a PaK 35/36 anti-tank gun crew attaching their weapon to a vehicle. This gun was developed by Rheinmetall in 1933 and was first issued to the German army three years later. By the start of the invasion of Poland in September 1939 some 9,120 had been manufactured, with a further 5,339 built during the war.

Seen here is a PaK 35/36 crew during a training exercise with one of the gunners kitted out in the familiar white training shirt. A trainer can be seen watching the crew preparing the gun for firing.

The crew of a PaK 35/36 at a barracks during training pose for the camera. They are all wearing their white training uniforms. The crew's trainer stands with them before going out on exercise. Crews were usually put through intensive anti-tank training which would enable them during battlefield conditions to be efficient and effective with their weapon at all times.

A close-up photo showing the PaK 35/36. Although the gun was comparatively small it had a potent 37mm L/45 barrel with an angled armoured splinter shield. It had two road wheels and was bolted to two split tubular legs. It was light and easily movable and could be used in a number of battlefield situations.

During the invasion of Poland in September 1939 and a PaK 35/36 gun crew can be seen with their weapon by the side of a road. The gun has been extensively camouflaged.

A PaK 35/36 gun crew have set up their weapon on a farmstead during operations in Poland in September 1939. Note one of the tubular trails has a log of wood placed on it. This was done to give the weapon more stability, minimising movement when aimed and fired. Often crew sat on the trails, but under hostile fire, normally exposed in the open, they would have been compelled to hide behind the gun or take cover nearby.

A 35/36 PaK crew in a Polish square in September 1939. It was in Poland that anti-tank crews found that their PaK guns were more than adequate for operational needs in the face of relatively modest armoured opposition.

A gunner surveys the terrain through his 6 × 30 binoculars behind his PaK 35/36. The PaK 35/36 became the standard anti-tank gun of the German army in the early part of the war. It weighed 432kg (950lbs) and had a sloping splinter shield. The gun fired a solid shot round at a muzzle velocity of 762m/s (2,500ft/s) to a maximum range of 4,025m (13,200ft).

(**Above**) During the Polish campaign a PaK 35/36 gun crew can be seen next to a building with the name of the town 'Biskupice' blazoned across the top.

(**Opposite, above**) During the French campaign in May 1940, this Panzerjäger I can be seen moving towards the front. The formal name of the equipment on these vehicles was 4.7cm PaK(t) (Sf) auf Panzerkampfwagen I 'ohne Turm', (4.7cm anti-tank gun on turretless Pz.Kpfw.I). The gun was Czech-built. For the French campaign these Panzerjäger I were assigned to anti-tank battalion Panzerjäger-Abteilung 521, six vehicles per company. Anti-tank Battalions 521, 616, 643 and 670 had ninety-nine vehicles. Only Anti-tank Battalion 521 saw action in France. The other three trained, but were sent to the front only just before the end of the campaign.

(**Opposite, below**) Next to a river during the French campaign is a PaK 35/36 anti-tank crew. Though these guns were very effective during the Polish campaign, it would not be until the war against France in 1940 that the German army became aware of the tactical limitations of the gun as their forces increasingly encountered heavier enemy armour.

(**Opposite, above**) Inside a French village and a PaK 35/36 crew stealthily edge their way forward towards enemy fire. Of interest, note how the crew has utilized obsolete ammunition boxes and attached them to the gun's splinter shield. Also note a dismounted cyclist observing a dead comrade lying face down on the pavement, evidently caught in crossfire.

(**Opposite, below**) A PaK 35/36 in the field during a fire mission. Note the discarded ammunition boxes indicating the intensity of the anti-tank attack. This gun was capable of causing serious damage to its opponent, even though it was not very effective at penetrating thick armour. While it proved its worth to some extent in the west in 1940, a year later on the Eastern Front it became inadequate in the face of growing armoured opposition.

(**Above**) Wehrmacht troops manhandling a 3.7cm PaK 35/36 gun down a river bank and onto what appears to be an inflatable boat. Ammunition boxes have been attached to the gun's splinter shield. Note the French prisoners on the river bank watching the gun being transported.

(**Above**) A PaK 35/36 crew during a fire mission on a road during the French campaign. One of the gunners is observing the location of the enemy through a pair of 6 × 30 binoculars. Ammunition was either armour-piercing, high-explosive, high-velocity, or hollow charge projectiles.

(**Opposite, above**) A PaK 35/36 gun crew in the field using the tree line for concealment. While these guns were powerful for their time, crews soon realized that the British Matilda II and French Char B1 heavy tanks were difficult to defeat, especially at longer ranges. Often their projectiles would bounce off the tank's thick armour.

(**Opposite, above**) The crew of a PaK 35/36 have moved their weapon into position for a fire mission. Although this anti-tank gun had reached its ceiling of effectiveness against the heavier enemy tanks of its time, the gun was still effective against most common light tanks, such as the French R35.

(**Above**) Troops of the infamous Waffen-SS 'Das Reich' Division during its notorious march through northern France in early June 1940. As the war progressed both Wehrmacht and Waffen-SS units would be well supplied with a host of anti-tank guns. In this photo SS PaK 35/36 gunners have positioned their weapon on a road during operations in France.

(**Opposite, above**) A PaK 35/36 gun crew manhandle their weapon up a river bank during operations in France. A typical infantry regiment controlled three infantry battalions, an infantry gun company with six 7.5cm le.IG 18 and two 15cm s.IG 33 guns, and an anti-tank company with twelve 3.7cm PaK 35/36 guns.

(**Opposite, below**) A PaK 35/36 gun crew have used a horse to pull their weapon along a field during operations in France in May 1940.

(**Opposite, above**) A well camouflaged PaK 35/36 anti-tank gun positioned at the side of a road during the French campaign in 1940.

(**Opposite, below**) A PaK 35/36 gun crew from the Das Reich Division during operations in France in June 1940. For France the Waffen-SS had raised two additional motorised anti-tank battalions. These comprised three companies of 12 3.7cm PaK 35/36s. In addition, the 'Totenkopf' Division had a motorised reconnaissance battalion containing a towed anti-tank platoon equipped with a further three guns. When the invasion of the Low Countries and France began the Waffen-SS had some ninety PaK 35/36 guns in their units. However, both the Waffen-SS and Wehrmacht soon came to realize the tactical limitations of this weapon.

(**Above**) A number of armoured vehicles and infantry advance through a field accompanied by a PaK 35/36 anti-tank gun crew.

A Pz.Kpfw.IV rushes past a PaK 35/36 anti-tank crew during operations in France in May 1940. While the anti-tank gun battalions had located the enemy and softened the targets the tanks would be ordered through to clear the area.

Chapter Two

Operations in Russia

As plans were being drawn up for the invasion of Russia, heavier PaK guns were being designed and tested to deal with heavier enemy tanks. The first weapon to be produced was built by Rheinmetall-Borsig and was as large as a full-sized artillery gun: the 5cm PaK 38. The gun was a replacement to the 3.7cm PaK and was of conventional design, fitted with a muzzle brake and a semi-automatic breech. The carriage was again a split-trail type with tubular legs and solid-tyred disc wheels. The weapon was more than capable of penetrating the 45mm sloped armour of a T-34's hull at close range. It was also equipped with Panzergranate 40 APCR (Armour-Piercing Composite Rigid) shots with a hard tungsten core to penetrate the thick armour of the heavier KV-1 tank.

When the attack on Russia was initiated in June 1941, the Germans were still limited in their anti-tank gun capabilities. Although the PaK 35/36 had become ineffective against the new Soviet T-34 and KV-tanks, it was still used by its units to halt lighter armoured vehicles. The 5cm PaK 38 on the other hand was used with success against the T-34. The Panzerjäger I saw extensive action in the early part of the Russian campaign but it soon became apparent that it was no match for the growing Soviet arsenal and losses mounted.

In spite of the underperforming anti-tank capabilities of the summer months of 1941, German forces were exhilarated by their string of victories as they pushed inexorably forward. It was Blitzkrieg once again and there was a feeling of invincibility among the men. However, the mass of Russian armour, notably the T-34 and KV-1 tanks, was overstretching German PaK gunners and there was increasing concern that units were not able to contain them.

Back in Germany, weapon manufacturers were busy designing more powerful anti-tank guns to destroy the growing threat of the Soviet tank armada. One such weapon to be rushed to the front in late 1941 was the 7.5cm PaK 40. The gun was essentially an enlarged version of the 5cm PaK 38, of similar design with a split-trail carriage and a double-skinned splinter shield. It was designed to fire the same low-capacity APCBC (Armour-Piercing Capped Ballistic Cap) HE and HL projectiles that had been standardised for use in the long barrelled Kampfwagenkanone (KwK) 40 tank-mounted guns such as the later variants of the Pz.Kpfw.IV tank. In addition, there

was an APCR shot (Panzergranate 40) for the PaK 40, capable of knocking out heavier Russian armour.

Out on the battlefield the PaK 40 was a powerful and effective anti-tank weapon, but its weight was high and crews often found it not so easy to move quickly from one position to another. Sometimes they even had to abandon their guns as they got stuck in bad ground in the harsh winter conditions. Yet in spite of this, the gun performed well and remained in service throughout the war. A variation of the PaK 40 was produced, the 7.5cm PaK 41, but only 150 of them saw active service due to the restrictions placed on the tungsten for its ammunition.

As the German forces battled through Russia, the need for more anti-tank guns mounted and the need for improvements became drastic. A number of captured guns were pressed into service, including the French 75mm model 1897. The barrels of these guns were removed from their original mountings and fitted onto a modified 5cm PaK 38 carriage. A cage-type muzzle brake was fitted to reduce the recoil stresses and a hollow charge round was provided. The anti-tank gun was named the PaK 97/38. On the battlefield the gun was light with good mobility and had sufficient anti-armour performance with a HEAT shell which was more than capable of penetrating a T-34 in most situations, and sometimes could pierce the side armour of the KV. This captured gun soon became a well-regarded anti-tank weapon. However, there were problems, particularly its low muzzle velocity. Although this did not affect the armour-piercing characteristics of its HEAT ammunition, it meant insufficient performance when firing regular AP shells. Due to its low effective range of about 500m it had difficulties hitting small mobile targets. Crews also found that despite its muzzle brake the gun had a quite fierce recoil action, especially when firing AP shells. Still, despite these problems it was to remain in service until the end of the war and countered enemy armour with success.

Over the following months, the war in Russia continued with unabated ferocity, and Soviet tank production increased to levels that the Germans could never have imagined. With no sight of the war ending soon, the need for more anti-tank guns became a necessity. The German army realised that production of anti-tank guns was insufficient, and the guns that were already operating were in need of improvement.

(**Opposite**) Two photographs showing members of a field maintenance team servicing a PaK 35/36 anti-tank gun just before the invasion of the Soviet Union in June 1941. The gun, although outdated and inadequate for the war against Russia, was still robust and reliable and served anti-tank gun crews well during the early part of the invasion.

(**Above**) An interesting photograph showing the initial invasion of the Soviet Union with armoured vehicles spread out across a field on the advance. Note the halftrack in the background towing a PaK 35/36 anti-tank gun. The Horch vehicle nearest the cameraman displays the divisional insignia of the 3rd Panzer Division above the rear wheel arch.

(**Opposite, above**) A gun crew of the Waffen-SS during the opening stages of the German attack into Russia. This photograph has been taken during a fire mission using the PaK 35/36 against an enemy target.

(**Opposite, below**) While there were masses of wheeled and tracked vehicles that invaded Russia in June 1941, the bulk of German's motive power at this time was undertaken by animal draught. In this photograph a column of horse-drawn soldiers are hauling artillery and anti-tank guns to the front lines.

(**Above**) Positioned on a typical muddy road somewhere in the Soviet Union is a PaK 35/36 gun crew. Note the ammunition boxes have been prepared and positioned next to the gun ready for a fire mission.

(**Opposite, above**) Lying in a field is an anti-tank gunner armed with the Panzerbüchse 39 (PzB 39). The weapon was an improvement on the earlier production PzB 38. As with operations in Poland, in Russia the success rate using this rifle was good, but only against lightly armed opposition. The weapon was far from adequate against heavier armour-plated vehicles.

(**Opposite, below**) In North Africa the DAK or 'Deutsches Afrikakorps' widely used the PaK 35/36 anti-tank gun against British tanks. Here in the desert a PaK 35/36 has been partially covered by sheeting to protect it from sand and dust and conceal it from enemy surveillance. Note all the PaK team wearing the distinctive pith helmet.

(**Opposite, above**) A new anti-tank gun saw extensive action in Russia during the early part of the war known as the 5cm PaK 38, as seen in this photograph being towed by horses across a field. This gun was used with particular success on the battlefield and was very effective against the Soviet T-34 tank.

(**Opposite, below**) A Horch cross-country vehicle has halted on a road towing a PaK 35/36 anti-tank gun. Further along is a knocked-out Soviet tank with one of the PaK gunners standing next to it.

(**Above**) During a training exercise and the anti-tank gun crew are seen dismounted from the Sd.Kfz.10 halftrack with their 5cm PaK 38 on tow. The 38 was first introduced in April 1941, and when it was used on the Eastern Front that same year it was one of the very few early guns capable of penetrating the 45mm sloped armour of the T-34 tank, although it needed to be at close range to do it. It was also equipped with Panzergranate 40 APCR shots, which had a hard tungsten core to penetrate the armour of heavy enemy tanks like the KV-1.

(**Opposite, above**) A photograph taken of a gun crew with their 5cm PaK 38. This weapon was the first anti-tank gun to be in the same class as full-sized artillery. It was primarily built to replace the much smaller and less punchy PaK 35/36.

(**Above**) A PaK 35/36 anti-tank gun is being hauled by horses across a muddy field during operations in Russia. Note how a downpour turns fields into a sea of mud and mire. This was a constant hindrance to the German army's advance and caused extensive logistical problems.

(**Opposite, below**) A Waffen-SS gun crew with their 5cm PaK 38 during a fire mission. These guns were used extensively by both the Wehrmacht and Waffen-SS during the early part of the war on the Eastern Front. The weapon was also used by the Luftwaffe as a stop-gap anti-aircraft gun, actually renaming it the 5cm FlaK 214.

(**Above**) Russian soldiers have been captured and sit at the side of the road next to an abandoned Russian M-1937 45-mm light semi-automatic anti-tank gun. When captured these guns were redesignated by the Germans as the M1937 and used in the field as the 4.5cm PaK 184/1(r).

(**Opposite, above**) Waffen-SS troops manhandling a 7.5cm PaK 97/38 to another position during operations in Russia. These guns were adapted from captured French 75mm model 1897 guns and modified onto the gun carriages of the 5cm PaK weapon. The barrel had a cage-type muzzle brake fitted to reduce the recoil stresses that arose from the up-gunning of the carriage. A hollow charge round was provided.

(**Opposite, below**) A well dug-in and concealed 5cm PaK 38 during a pause in the fighting on the Eastern Front in late 1941. Between 1939 and 1944 some 9,500 of these weapons were produced.

Two photographs showing a pair of Sf14Z scissor binoculars that gave the user a better view of the terrain ahead. These binoculars were nicknamed 'donkey ears' and were able to estimate ranges for artillery and anti-tank gunners.

A PaK 35/36 gunner during winter operations on the Eastern Front. Note that a white sheet has been draped over part of the weapon to conceal it in the snow.

A Waffen-SS PaK 35/36 anti-tank gun crew during a fire mission in late 1941. A well concealed anti-tank position was capable of causing serious damage to the enemy, even though the PaK 35/36 had become inadequate for operational needs in the face of growing armoured opposition.

Chapter Three

Stop-Gap Solutions

By the beginning of the summer of 1942 the Wehrmacht opened up a new offensive to the south of Russia, but not all the divisions were fully equipped and ready for combat. Some of the older units did not have their losses from the winter offensive of 1941 replaced. Worn out and depleted divisions were relegated to Army Group North or Army Group Centre where they were hastily deployed for a series of defensive actions. The best-equipped divisions were shifted to Army Group South for operations through the Caucasus.

It was apparent that the Wehrmacht's ability to combat some of the Soviet tanks was still inadequate, in spite of this being their second year fighting on the Eastern Front. The Germans needed more powerful anti-tank guns that were mobile. In the field they had the punchy 7.5cm PaK 40, and a large number of captured Soviet 76mm F-22 Model 1936 divisional field guns were widely available for modification. This captured Soviet weapon had already been converted into the 7.62cm PaK 36(r) with a few simple changes, such as the reaming out of the chamber to suit a standard German cartridge case, notably that of the 7.5cm PaK 40, moving the elevating hand-wheel to the left side of the carriage, and installing a muzzle brake. Now this Soviet gun was going to be modified into a fast-moving German anti-tank gun. Already the Germans had adapted the Panzerjäger I to provide mobility for a heavier gun against enemy tanks. Now an interim solution was needed to deal with the urgent threat of being overrun by new Soviet T-34s and KV-1s. It was thus decided to adapt captured French vehicles such as the Lorraine, and the German Pz.Kpfw.II and 38(t) as the basis for makeshift anti-tank destroyers. The result was the Marder series: the Marder I, II and III. These vehicles provided mobility for either the captured Soviet 7.62cm PaK 36(r) gun or in later versions the German 7.5cm PaK 40 anti-tank gun.

The Marder I mounted the 7.5cm PaK 40 anti-tank gun on a Lorraine chassis. Later, several other French and Polish tanks were used as the conversion base for the Marder I, including the Hotchkiss H39 and the FCM 36.

Another anti-tank vehicle to be introduced in 1942 was the second series of the Marder, the Marder II. This was based on the chassis of the Pz.Kpfw.II. There were two versions, the first mounted modified Soviet 7.62cm guns firing German ammunition, the other mounted the powerful German 7.5cm PaK 40.

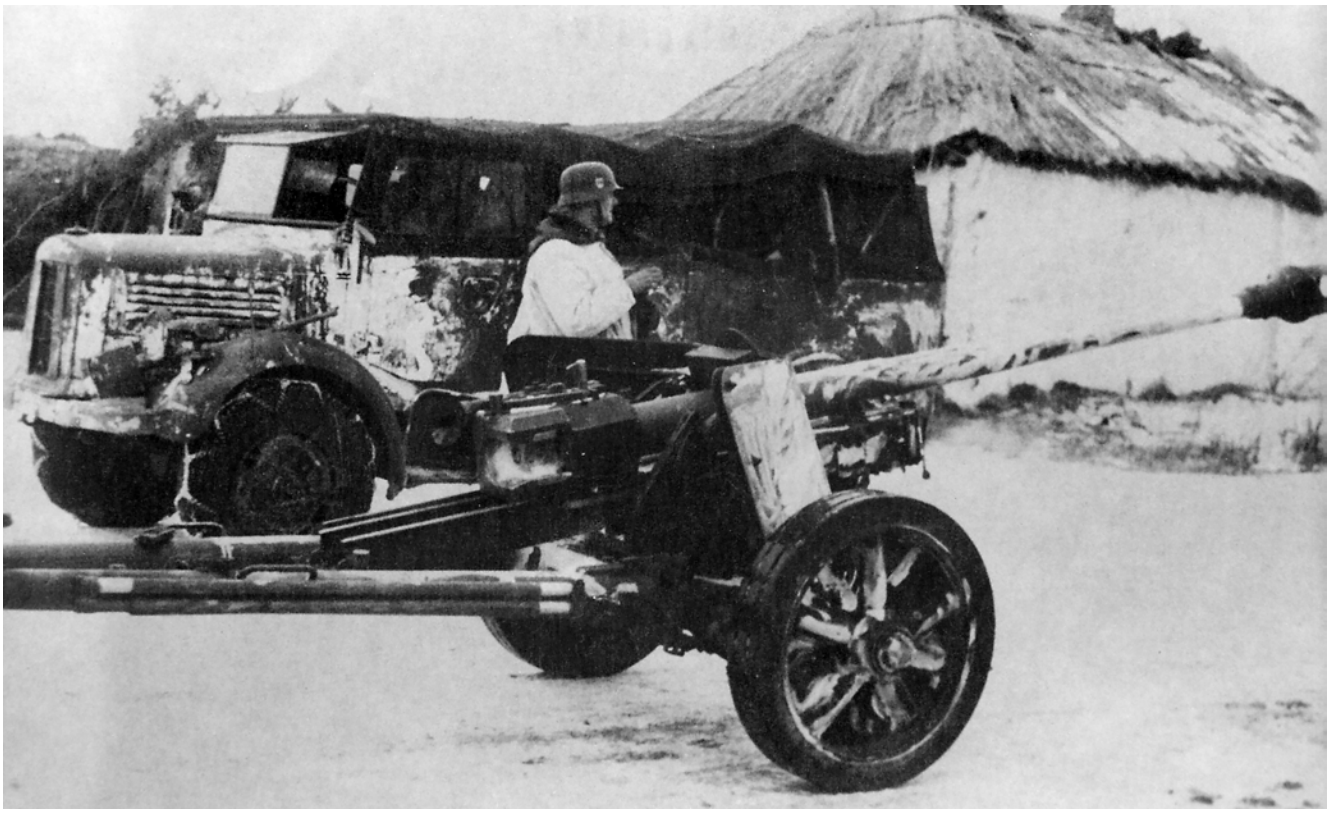
In the same year, the Marder III was produced. This vehicle mounted either the Soviet 76.2mm F-22 Model 1936 divisional field guns, or the German 7.5cm PaK 40 modified on the top of the chassis of the Pz.Kpfw.38(t).

Basically, the Marder was more a gun carriage than a proper Panzerjäger that could exchange shells with enemy tanks. Nevertheless, they undertook sterling service for both the Wehrmacht and the Waffen-SS and operated extensively in anti-tank roles.

For the next several months both Panzerjäger and anti-tank battalions continued supporting the Wehrmacht and Waffen-SS's drive East, both in defensive and offensive roles. The Panzerjäger units were either assigned to infantry regiments, or as a whole Abteilung (battalion) within Panzer and Panzergrenadier divisions. Independent battalions and regiments were used by corps to protect against possible tank attacks, while divisions would often position their Panzerjäger on the flanks or use them to support infantry advances against an enemy using tanks. When used with tanks, Panzerjäger would work in teams, with the crews enticing enemy tanks to fire, often disclosing their position, and engaged the enemy from mobile positions. Panzerjäger were regularly called upon to provide direct high explosive supporting fire to infantry by destroying machine gun and artillery positions, particularly in urban fighting.

As for the PaK units supporting the drive, their guns, usually mounted on two-wheeled carriages, were often towed into position then withdrawn and repositioned

A Waffen-SS anti-tank gunner stands next to his 5cm PaK 38 during early winter operations on the Eastern Front in 1942. The weapon has received some winter white camouflage paint to help conceal it in the snow.



While most anti-tank weapons were built purely to combat enemy armour, the Germans used the 8.8cm FlaK gun against ground targets as well, as both of these photographs depict. Both barrels have been lowered into a horizontal position on a cruciform platform mount. Note the Sd.Ah.201 limber units nearby.

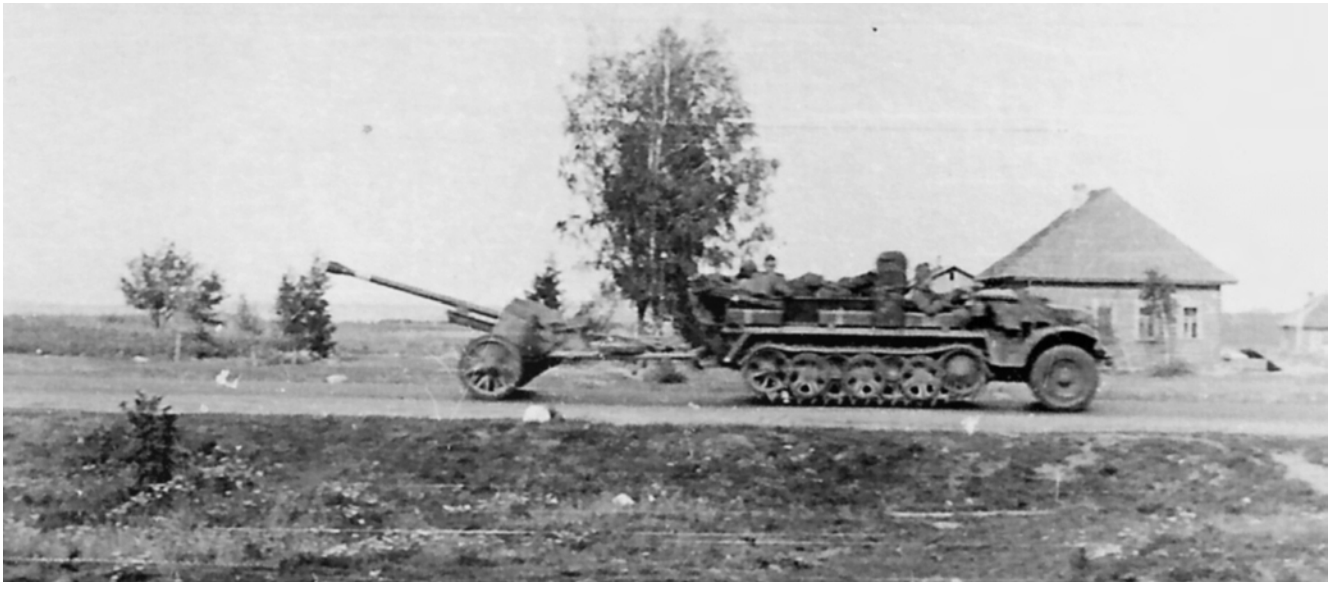
Here in this photograph is a well camouflaged Marder II Ausf.D mounting a 7.62cm PaK (r) gun.

rapidly. They could also be manoeuvred into position by hand. They all fired high-explosive and solid armour piercing rounds effective at medium range.

These PaK battalions supported the main thrust and were of importance for the preparation and successful conduct of an infantry or Panzer attack. When tanks or other armoured vehicles broke through the enemy forward defence lines, artillery, FlaK and PaK designated for the support followed in unison. The mission of these units was to neutralize the enemy on the ground and in the air. In a ground role, concentration on enemy tanks in assembled areas was a priority. Adjusting fire with high explosives was also initiated on probable enemy observation posts. The task of a PaK gunner against a ground target was the destruction of advancing enemy armoured formations, and where possible, destroy enemy defensive positions.

By the end of 1942 the weight of Russian armour had almost doubled from the previous year, and there was an increased awareness of adapting and producing more PaK guns to meet the mounting peril.

(**Opposite**) Two photographs showing a Marder III Panzerjäger during operations in 1942. This vehicle mounted either Soviet 76.2mm F-22 model divisional field guns, or the German 7.5cm PaK 40 anti-tank gun, in an open-topped cupola on the chassis of the Panzer 38(t). While it offered little protection to the crew, it added significant firepower. The Marder was not an assault vehicle nor was it an interim solution to a tank. Its sole purpose was to operate in urban areas or other close quarter combat situations where it could bring fire against enemy armoured vehicles. While these machines were more of a gun carriage than a proper Panzerjäger that could exchange shells with enemy tanks, they nevertheless undertook sterling anti-tank service for the Wehrmacht and the Waffen-SS.



Advancing along a road is a Sd.Kfz.10 hauling a 5cm PaK 38. Note the three metal ammunition boxes on the track guards and the 20-litre jerry-can between the first and second box.

Two photographs taken in sequence showing a PaK 35/36 anti-tank gun crew in a street during the first battle of Kharkov in 1942. The Kharkov area was regarded by both German and Soviet forces as pivotal on the Eastern Front, sitting astride two important strategic axes towards Kursk and the Donbas. At Kharkov the Russians believed that they would be able to regain the initiative and achieve strategic aims by pushing the Wehrmacht back and thus begin what they thought would be the beginning of the end of the German military machine in Russia. The reality was rather different. Stalin and his commanders were over-confident and underestimated Hitler's determination to capture what he regarded at the time as the most strategically important city in southern Russia. What followed in May 1942 was a bloody battle of attrition in which the Soviet army lost hundreds of thousands of soldiers in one of the most catastrophic offensives of Russian military history.

(**Opposite**) A ground Luftwaffe PaK crew manhandle their 5cm PaK 38 through some undergrowth during operations on the Eastern Front in 1942. These Luftwaffe troops fought well, supporting Wehrmacht troops both in offensive and defensive roles. Through 1942 the Luftwaffe field divisions were directly under Luftwaffe command, but continued supporting the Heer's drive East. They defended more often than they attacked. Often Luftwaffe PaK units supported the main drive and were considered to be of decisive importance for the preparation and the successful conduct of a Panzer attack. When a tank or other armoured vehicle broke through the enemy forward defence lines, artillery and PaK designated for support followed in unison. The main task of a PaK gunner against a ground target was the destruction of advancing enemy armoured formations and, where possible, to destroy any enemy defensive positions. However, by the end of 1942 the threat from enemy armoured ground attack had almost doubled from the previous year and there was an increased awareness of adapting and producing more PaK guns in all the services to meet the mounting peril.

(**Above**) A 5cm PaK 38 gun crew during the battle of Stalingrad in the summer of 1942. Being exposed in the street like this meant that gunners often had to give their guns additional protection, which also helped conceal the weapon.

Two photographs taken in sequence showing a 5cm PaK 38 gun crew which has taken drastic measures to conceal their weapon in the bombed and blitzed city of Stalingrad in August 1942. Note how the splinter shield has been given additional armoured protection with the use of steel sheets.

During operations around Stalingrad this 5cm PaK 38 gun crew can be seen moving their weapon into another position for a fire mission. Note how the foliage to help conceal the weapon has been attached to the gun shield, as well as the custom-made canvas cover wrapped around the gun's breech.

A PaK97/38 crew are seen preparing their weapon for a fire mission. Passing in the background along a dirt road is a Marder II Panzerjäger. This anti-tank vehicle, introduced in 1942, was the second series of the Marder. It was based on the chassis of the Pz.Kpfw.II. The first version mounted modified Soviet 7.62cm guns firing German ammunition, the other mounted the powerful German 7.5cm PaK 40 gun.

(**Above**) The crew of a 7.5cm PaK 40 gun prepares their weapon for a fire mission against a Soviet target. These guns were normally assigned to divisional anti-tank battalions but were often seen supporting grenadier anti-tank companies.

(**Opposite**) Two photographs taken in sequence showing the loading of an anti-tank projectile into the breech of a well concealed 7.5cm PaK 40 gun, and the gunner looking through the gun sight in preparation to fire the weapon against a Soviet target. Often anti-tank gun crews would provide what was known as a 'over-watch' to support tanks in the advance, since the tanks could not accurately fire while on the move.

Anti-tank gun numbers were drastically increased in mid-1942 as the Germans were met by masses of heavy Russian tanks. Production of PaK 40 was greatly augmented to form the bulk of anti-tank artillery. The Fallschirmjäger (para-troopers) were also given additional anti-tank guns to combat the developing threat. In this photograph a PaK 40 is manned by Fallschirmjäger anti-tank gunners.

Out in a field a Waffen-SS anti-tank gun crew can be seen with their 7.5cm PaK 40 during a fire mission. Note the foliage attached to the bolt heads of the splinter shield. This was common practice for anti-tank gunners.

A well camouflaged 7.5cm PaK 40 partially hidden in the tall grass during an operation. Note the protective shield for the gunner, near to the breech-block. This was designed to prevent him from being injured by enemy fire or shrapnel blasts at close range, or when the gun tube recoiled.

This new 7.5cm PaK 40 is being loaded for a fire mission in a field during operations on the Eastern Front in the early summer of 1942. This gun was an enlarged version of the PaK 38, using a similar split-trail carriage and a double-skinned splinter shield. It became the standard German anti-tank weapon, remaining in service throughout the war.

(**Opposite, above**) While it appears that this 5cm PaK gun crew are involved a fire mission against an enemy target, as they are not wearing helmets it is more likely they are training before moving off to the front. Crews often trained just to the rear of the front lines, as it was deemed that the men would be fresh from training for active combat.

(**Opposite, below**) In winter 1942 a 7.5cm PaK 40 gun crew can be seen positioned in a town during operations on the Eastern Front. By this period of the war PaK guns were being used in their thousands on various sectors of the Eastern Front and saw some fierce fighting. For the time being, the Germans maintained more or less the strategic initiative on the Eastern Front.

(**Above**) Along a road somewhere on the Eastern Front a column of horse-drawn vehicles are hauling supplies to the front during operations in 1942. Note the PaK 35/36 being moved by animal draught, which was typical during this early period of the war in Russia.

Preparing their PaK 38 for firing is a gun crew out in a field. Four of the men are wearing mosquito nets over their M35 steel helmets. During the German advance, especially through northern and central Russia, soldiers found the surrounding swamplands to be infested with flies and mosquitoes.

Chapter Four

1943

By the beginning of 1943, Panzerjäger and PaK units were employed on various sectors of the Eastern Front and were heavily embroiled in fierce fighting. Through the first half of 1943 the Germans more or less maintained the strategic initiative on the Eastern Front and guns like the 5cm PaK 38, 7.5cm PaK 40, 7.5cm PaK 97/38, and 7.62cm PaK 39(r) were being extensively used. Yet, despite this array of anti-tank weapons, the Germans knew they had been caught out. In the early part of the war they had created a powerful Panzerwaffe capable of independent strategic operations but had devoted little attention to stopping tanks. Now three years later and in the depths of the Soviet Union, its forces had found themselves hard pressed against modern Soviet armour. German troops now clamoured for more anti-tank firepower.

Thus, during the first half of 1943 the PaK 43 (Panzerabwehrkanone and Panzerjägerkanone) came off the Krupp production line. The PaK 43 was the most powerful anti-tank gun of the Wehrmacht so far to see service in significant numbers. It was relatively easy to produce: the carriage was a collection of modified stock components; the trail legs for the weapon were customised from the 10.5cm leFH 18 artillery gun; the wheels were taken from the 15cm sFH howitzer; and the saddle was a steel-plate fabrication that bolted everything together. The gun was fitted with a semi-automatic vertical breech mechanism that greatly reduced recoil. It could also be fired electrically while on its wheels. It had a very flat trajectory out to 914m, making it easier for the gunner to hit targets at longer ranges as fewer corrections in elevation were required. The weapon had outstanding penetration and could destroy the frontal armour of any Allied tank, even at longer ranges. It could even defeat the Soviet IS-2 tanks.

Due to the success of the PaK 43 the Germans were eager to fix it to a tank and modify it into a Panzerjäger. The need for new-generation tank hunters was now desperate. By mid-1943 the Nashorn was produced and the PaK 43 was mounted on the chassis of Pz.Kpfw.III and IV tanks. The vehicle was given numerous official designations, such as 8.8cm PaK 43 (L/71) auf Fahrgestell Panzerkampfwagen III/IV (Sf) or 8.8cm PaK 43 (L/71) auf Geschützwagen III/IV (Sd.Kfz.164); it was also designated as the Panzerjäger Hornisse.

Another Panzerjäger to enter service around this time was known initially as the Ferdinand (after its designer Ferdinand Porsche) and later the Elefant. It was fitted with the powerful 8.8cm PaK 43/2 (early designation 8.8cm StuK 43/1) and was mounted on the chassis of a Tiger tank.

Both of these Panzerjäger saw their debut in July 1943. Much hope was hinged on these new modified vehicles to support both panzer and infantry during the German summer offensive of 1943, Operation Zitadelle.

However, within two weeks of the operation, the Red Army had repulsed the German forces with considerable losses. In August, soon after the German failure at Kursk, the Red Army counterattacked towards Orel and Kharkov and launched a massive attack against Army Group Centre. For nearly three months the Russians fought a series of heavy clashes against the Centre and managed to recapture Smolensk and the rail junction at Nevel, forcing back the Germans on a broad front. The Russian attack only faltered in the Vitebsk–Orsha–Mogilev area where almost impregnable lines of defences had been erected by the Germans.

Elsewhere on the Eastern Front, Red Army assaults caused severe losses to the Wehrmacht, Waffen-SS and Luftwaffe, but the Germans managed to hold them back for the time being. Heavy PaK guns and vehicles like the Marder, Nashorn and the Ferdinand helped fulfil the German objective of quickly providing mobile anti-tank firepower, thereby buying Germany time to hold and prepare their lines.

Operations against the Red Army, however, were hampered by stiff resistance and the great distances involved in making war in Russia. As the autumn approached losses mounted and shortages in manpower and weaponry were once again dire.

(**Opposite, above**) German troops inspect a knocked-out Russian 45mm M1937 or M1942 anti-tank gun. The Germans often reused these guns on the carriages of PaK 35/36 and re-barrelled them to fire more effective high explosive rounds. The anti-tank guns were known as the 4.5cm PaK 184(r) and PaK 184/1(r).

(**Opposite, below**) An interesting photograph showing 7.5cm PaK 97/38 gunners during winter operations in early January 1943. Note that the wheels of the weapon have skids on them to slide across the snow quickly enabling the crew to move the gun from one fixed position to another. The gun is being hauled by animal draught.

(**Opposite, above**) The crew of a 7.5cm PaK 40 during a fire mission inside a town during winter operations. This gun was designed to fire the same low-capacity APCBC, HE and HL projectiles that had been standardised for use in the long barrelled Kampfwagenkanone (KwK) 40 tank-mounted guns of mid-war and later variants of the Pz.Kpfw.IV tanks.

(**Opposite**) A whitewashed Sd.Kz.10 halftrack with a mounted 5cm PaK 38 on the advance towards the battle-front in early winter 1943. At this period of the war the Germans were up-gunning, converting and modifying their anti-tank guns to deal with the ever increasing threat of enemy armour.

(**Above**) Waffen-SS 'Totenkopf' PaK gunners with their weapon during a pause in operations in what was known as the Third Battle of Kharkov in February/early March 1943. The German victory at Kharkov had come at a heavy price in blood: some 12,000 soldiers were killed.

(**Above**) This photograph was taken after the capture of Kharkov in March 1943. It shows an Sd.Kfz.251 halftrack with a mounted PaK 35/36 gun. Note the national flag draped over the front of the vehicle for aerial recognition.

(**Below & opposite, above**) Two photographs showing the 7.5cm PaK 97/38 during winter operation. In the field these guns were still being extensively used. However, in spite of their vast array of anti-tank guns, the Germans found themselves hard pressed against modern Soviet armour.

(**Below**) On a fire mission is the Nashorn or rhinoceros. The Nashorn looked similar to the Hummel, but unlike the Hummel this light turretless vehicle mounted a lethal PaK 43 heavy anti-tank gun. The Nashorn entered production in early 1943, and during a period of transformation it was given numerous designations, such as 8.8cm PaK 43 (L/71) auf Fahrgestell Panzerkampfwagen III/IV (Sf) or 8.8cm PaK 43 (L/71) auf Geschützwagen III/IV (Sd.Kfz.164), and it was also designated as Panzerjäger Hornisse (hornet). Much hope was hinged on the success of these new modified anti-tank vehicles to support the panzer and infantry during the German summer offensive in 1943.

(**Opposite, above**) During a fire mission a gun-loader can be seen preparing to ram another round into the breech of this 7.5cm PaK 97/38 during winter operations on the 'Ostfront' (Eastern Front). Behind him another crewman holds another round at the ready. Note how the gun's position has been concealed with stacked straw.

(**Opposite, below**) A 7.5cm PaK 40 crew preparing their weapon for a fire mission in March 1943. While this gun proved a powerful and deadly weapon, especially in the hands of well-trained gunners, because of its weight it did lead to instances where the crews had to reluctantly abandon their weapon.

(**Above**) A Waffen-SS 7.5cm PaK crew during a fire mission on the Eastern Front in spring 1943. Note the amount of spent shells on the ground, indicating a heavy contact with the enemy.

(**Opposite, above**) 7.5cm PaK 40 gunners on a fire mission during operations in Russia. Some 20,000 of these guns were produced. By 1943 it had become so successful that it armed many of the German mid-war tank and destroyer designs, replacing the PaK 40 in the latter role.

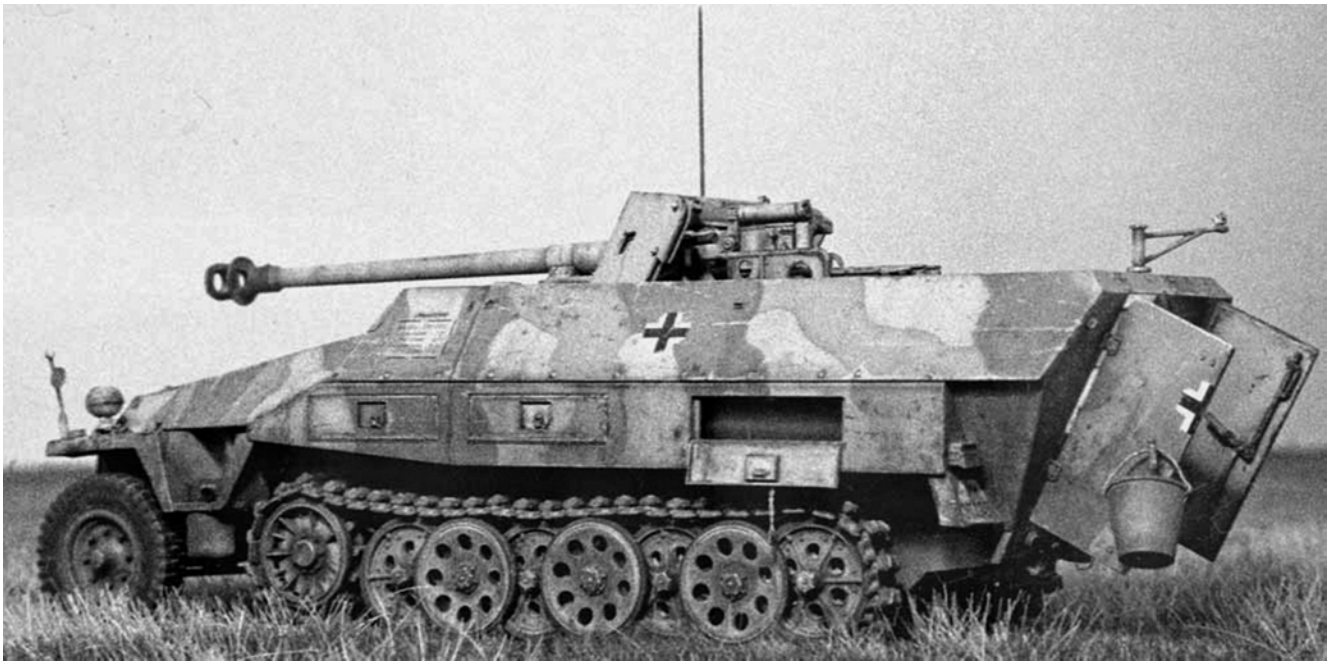
(**Opposite, below**) A whitewashed 7.5cm PaK 40 being hauled by a Steyr-built RSO tractor. Note that the weapon has been placed on sled-like skids under each wheel for the gun to travel unhindered across the snow.

(**Above**) A whitewashed 7.5cm PaK 40 is being moved into position for a fire mission against an enemy target. Crews did not find the PaK 40 easily manoeuvrable especially when they had to quickly move it from one firing position to another. This was more difficult still in mud or snow.

(**Above**) Positioned at the side of the road in a field is a 7.5cm PaK 40 gun crew. One of the gunners surveys the terrain ahead through a pair of 6 × 30 Zeiss binoculars trying to assess the location of the enemy. Two of the men wear the waterproof Zeltbahn.

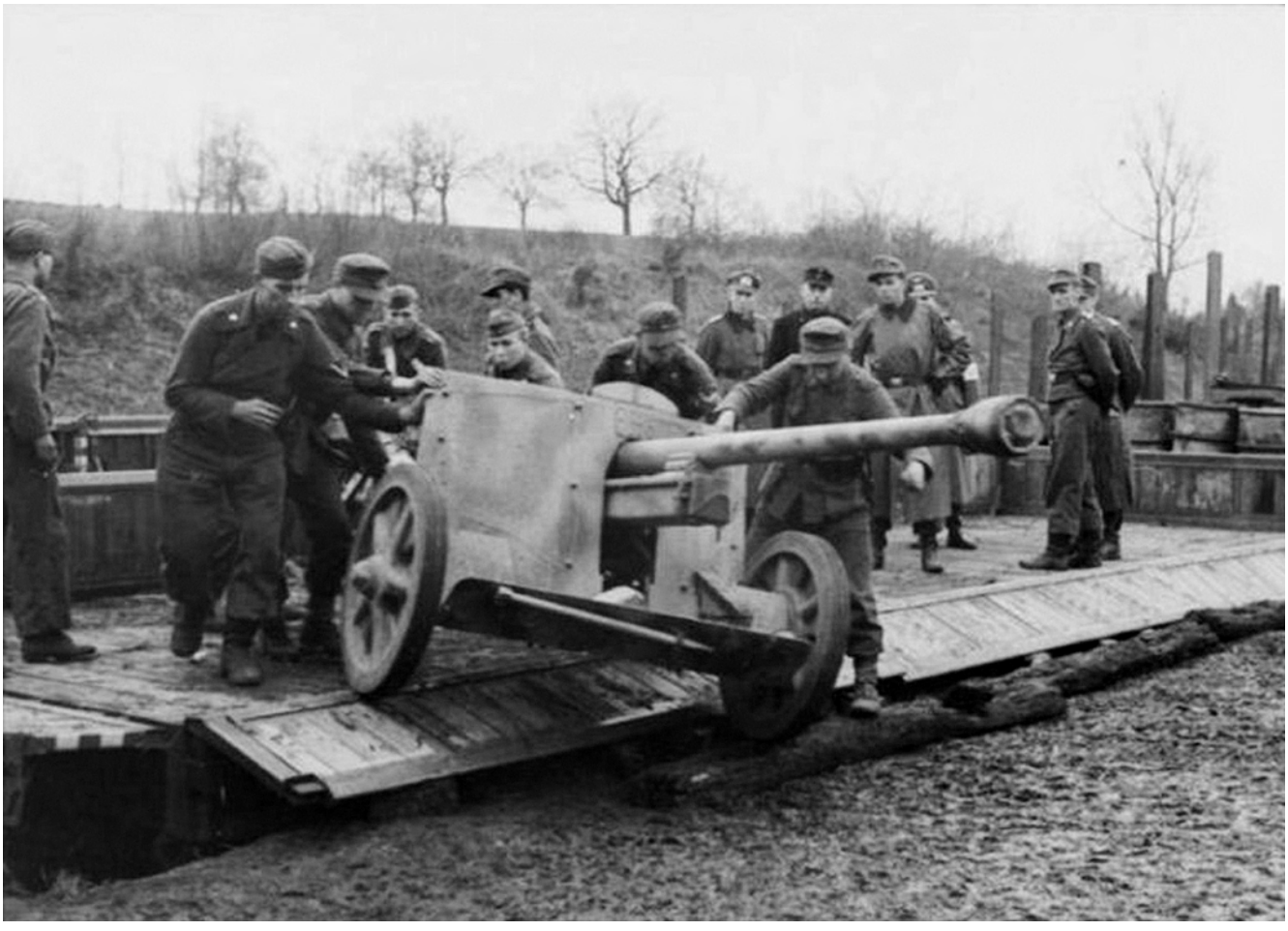
(**Opposite, above**) The crew of this Marder III Panzerjäger pose for the camera. This vehicle is fitted with a captured 7.62cm Soviet Model 36 anti-tank gun. The vehicle also had a travel lock on the front of the hull to secure the huge PaK barrel while travelling long distances. Some 418 of these variants were built in 1942 and were used as mobile anti-tank vehicles.

(**Opposite, below**) An Sd.Kfz.10 towing a PaK 38 L/60 is crossing a pontoon bridge on the Eastern Front.



An Sd.Kfz.251/22 Ausf.D can be seen mounting a PaK 40 in field during operations in Russia.

A 7.5cm PaK 40 gun crew are seen unloading their weapon from a special flatbed rail car during operations in Russia in 1943.



A well camouflaged PaK gun during operations on the Eastern Front in 1944.

A PaK 40 being hauled by an artillery tractor to another position in 1943. The gun with its L/46 barrel had a larger double-baffled muzzle brake. The gun was well designed with its sliding breech block mechanism built horizontally which allowed for a rapid fire rate.

(**Above**) During the battle of Kursk in the summer of 1943 a 7.5cm PaK 40 can be seen well sited and concealed in a field. By the appearance of the gun team, they are preparing their weapon for a fire mission.

(**Opposite, above**) During operations on the Italian Front in 1943 is a well camouflaged 7.5cm PaK 40 being prepared for a fire mission. By this period of the war this weapon had become the backbone of operations against enemy armour.

(**Opposite, below**) A 7.5cm PaK 40 gun crew have positioned their weapon in an anti-tank road block during fighting in an Italian town in 1943. This weapon was effective against almost every Allied tank, only struggling to penetrate heavier vehicles such as the Russian IS tanks, the American M4, M6, and later variants of the British Churchill. The PaK 40 was much heavier than the 38 and crews, especially with the terrain in Italy, found it difficult and sometimes impossible to move it without an artillery tractor.

(**Above**) The crew of a 7.5cm PaK 40 are preparing their weapon for a fire mission on the Italian Front. Note the projectiles primed and ready for action. Unlike the PaK 38, the PaK 40 allowed a larger charge to be used and a higher velocity for the PzGr 39 armour-piercing shells, which could easily penetrate most enemy tanks.

(**Opposite, above**) During summer operations this Panzerjäger Marder I Sd.Kfz.135 is seen operating in the field in 1944. This converted anti-tank vehicle is armed with the 7.5cm PaK gun. Most of the Marder Is were mounted on the base of the Tracteur Blinde 37L (Lorraine) French artillery armoured personnel carrier of which the Germans captured 300 following the capitulation of France in June 1940. The vehicle is easily distinguishable from the Marder family by its distinctive French wheel arrangement. As with the other Marders it mounted a high box-like thinly-armoured open-topped superstructure that sloped to the rear. The 7.5cm PaK 40 was mounted with its front shield fitted directly over this superstructure frame. The long overhanging cannon also required a gun cradle bolted onto the front hull.

(**Opposite, below**) PaK gunners have moved their weapon into a well concealed position waiting for approaching armour. Note one of the gunners surveying the terrain ahead trying to locate the enemy.

(**Opposite, above**) Abandoned in the snow is a French-built Lorraine 3L with a PaK 40 on tow.

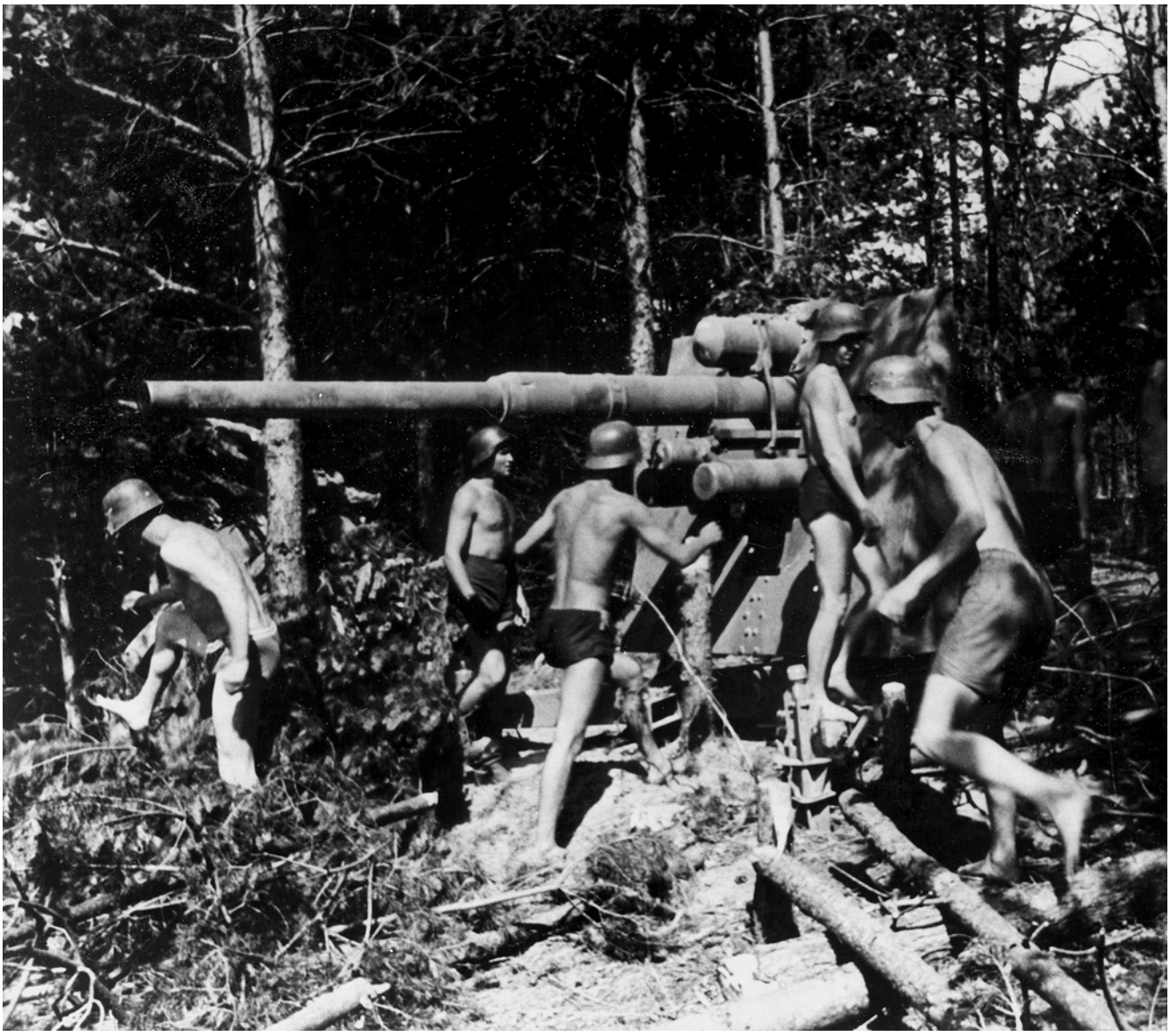
(**Opposite, below**) An interesting photograph taken during operations in Italy showing gunners and troops hauling a 7.5cm PaK 40 to another position. The weight of this gun can be well imagined by the number of soldiers required to move it.

(**Above**) A PaK 40 being hauled to the front during operations in Italy in 1943. During the Italian campaign this gun went on to be the most widely used and successful anti-tank gun. However, production was limited by critical shortages of metal.

(**Above**) This 7.5cm PaK97/38 is being readied for a fire mission during the Italian campaign in 1943. The gun had good mobility and sufficient anti-armour performance with a HEAT shell which was good enough to penetrate most Allied vehicles. The gun was a very capable anti-tank weapon, but it had low muzzle velocity meaning that it had to get nearer to its target before firing.

(**Opposite, above**) A 7.5cm PaK 40 being prepared for action during operations on the Italian Front in 1943. Note how concealed the gun is. The crew have used foliage over the gun carriage and barrel to hide it in the undergrowth.

(**Opposite, below**) An excellent photograph showing a well camouflaged 7.5cm PaK 40 and its crew waiting for enemy armour to approach. Note the Pz.Kpfw.IV hiding in the background. Often tanks would advance to contact the enemy to draw them out into action into what was known as an anti-tank screen, commonly called a 'PaK Front'. The tank would often duel with the enemy tank, or it would wait and let the PaK gunners attack leaving the tank to draw off more enemy armour.



(**Opposite, above**) In a field in 1943 during operations in Italy is a 7.5cm PaK 40 gun crew. In an offensive role this gun proved its worth, but in a defensive position crews would often find themselves being overrun as their personal weapons were minimal.

(**Opposite, below**) Waffen-SS PaK crews at a training ground in 1943. These gunners would soon strike fear into the hearts of their opponents on all fronts. Often clad in their trademark camouflaged uniforms and displaying an unmatched tenacity and zeal they would become dangerous opponents with their anti-tank guns in both attack and defence.

(**Above**) During preparations in northern France along the Normandy coast is a concealed FlaK 8.8cm with its barrel in a horizontal position for firing against ground targets. Note the FlaK gun crew, all of which have stripped down to their underwear in the heat of the summer day. However, they are all wearing their helmets.

(**Opposite, above**) A PaK 35/36 anti-tank gun crew can be seen moving their weapon from one position to another during preparations in the Normandy sector of France in May 1944.

(**Opposite, below**) Here is well camouflaged grenadier armed with a Panzerfaust on the Western Front in 1944. During the German retreat through France grenadiers put up stiff resistance with defensive lines. Along these lines were heavy machine gun platoons dug in holding each end of the line with crude obstacles erected. Troops were emplaced in defensive positions armed with a motley assortment of PaK and FlaK machine guns, Panzerfaust and Panzerschrek.

(**Above**) Grenadiers on the march through Holland in September 1944. Some can be seen armed with the Panzerfaust. By this late period of the war there was a dramatic increase in the loss of Allied tanks to the Panzerfaust: more than half of the tanks knocked out in combat were destroyed by Panzerfausts or Panzerschrecks.

(**Above**) The crew of a well positioned PaK 97/38 preparing for a fire mission against an enemy target. This weapon reached the battlefield in the summer of 1942. Despite moderate effectiveness and an aggressive recoil, it remained in service until the end of the war. The gun was used extensively: some 37,800 HEAT shells were produced in 1942 and a staggering 371,600 by 1943.

(**Opposite, above**) A typical scene for PaK gunners during operations. Often PaK gunners would move their weapon onto roads to block oncoming enemy armour. They would destroy anything that moved on or across the road.

(**Opposite, below**) A column of vehicles in the Balkans, more likely an anti-partisan operation. A gun, which appears to be either a PaK 38 or 40, is being hauled by a halftrack Sd.Kfz.10.

A photograph the moment this PaK 40 is fired during an attack against an enemy target. The noise of the blast is evident by one of the gunners plugging his ears. This weapon has been positioned in a field and is well camouflaged.

An interesting photograph showing Finnish troops undergoing training with the Panzerfaust 60 (left) and 30 (right) by a German Unteroffizier. The numbered Panzerfaust indicated the approximate effective range in metres. However, the Panzerfaust 60 actually had a maximum range of 80m, which was acceptable for a hand held anti-tank weapon.

Another photograph showing Finnish troops being trained to use the Panzerfaust. This particular weapon is the Panzerfaust 30, which the Finns called the 'Panssarikauhu'. During the war Finnish troops used the Panzerfaust more than any other nationality except Germans.

A young assault gun grenadier armed with his Panzerfaust during operations on the Eastern Front. Note special award badges stitched to his tunic upper arm for close combat of a tank or single combat. On the Panzerfaust firing instructions a back-blast warning was stencilled in black on the sides of the dark yellow launcher tubes. Sometimes instructions were printed on a black on white paper label which was stuck on the lower part of the warhead body.

(**Opposite, above**) Grenadiers are seen on a road preparing what appears to be an anti-tank road block. They are all armed with the Panzerfaust 30 anti-tank gun. Some wear a mosquito net pulled over their helmets to combat the flies and mosquitoes that often plagued the Eastern Front especially in swampland areas.

(**Opposite, below**) A well camouflaged grenadier armed with the Panzerschreck or Raketenpanzerbüchse 54. The RPzB 54 was a hand-held 8.8cm reusable personnel anti-tank rocket launcher. Another nickname was the 'Ofenrohr' (stove pipe) because it produced a lot of smoke on firing. The Panzerschreck was designed as a lightweight disposable infantry anti-tank weapon and was an enlarged copy of the American bazooka. It was shoulder-launched and fired a fin-stabilised rocket.

(**Opposite, above**) During a lull in the fighting on the Eastern Front are PaK gunners resting in a field. On the battlefield the Germans found both the PaK 38 and 40 valuable. Russians who captured them, however, found them heavy and difficult to manoeuvre.

(**Opposite, below**) Another way to conceal an anti-tank gun in the open was digging a hole or trench so that the barrel of the gun was almost level with the ground. This not only hid most of the gun including its distinctive wheels but also protected the crew from enemy fire. Note how well this PaK gun has been hidden.

(**Above**) The most powerful anti-tank gun to see service was the PaK 43. Here in this photograph the PaK 43 is being hauled by an Sd.Kfz.7 on a road somewhere on the Eastern Front. The PaK 43 saw service in significant numbers, also serving in modified form as the 8.8cm KwK 43 gun on the Tiger II, the open-top Nashorn, Elefant and Jagdpanther tank destroyers. This improved 8.8cm gun was fitted with a semi-automatic vertical breech mechanism which greatly reduced recoil. It could also be fired electrically while on its wheels. The gun had exceptional penetration and could destroy the frontal armour of any enemy tank even at long range even the Soviet IS-2 tank and IS chassis-based tank destroyers.

(**Opposite**) With the drastic need for more anti-tank guns the Germans often created hybrid pieces of ordnance. One such gun married the gun tube of the 8.8cm PaK 41 to the carriage of the 10.5cm IeFH 18. Sometimes these guns were mounted onto the wheels of the 15cm sFH 18. A newly designed splinter shield was bolted onto the carriage and from this the PaK 43/41 was created. In this photograph the PaK 43/41 is being moved by gunners to another position on the Western Front. The 43/41 proved heavy and cumbersome to handle, especially on uneven terrain or in the mud and snow. Gunners often referred to this weapon as the 'Scheunentor' (barn door) due to the size and weight of its gun. Despite this it was an effective weapon on the battlefield and scored many success on all fronts.

(**Above**) A Ferdinand Elefant Panzerjäger has halted inside a Russian village in 1944. The Elefant was fitted with the powerful anti-tank 8.8cm Panzerjägerkanone 43/2 gun (early designation 8.8cm StuK 43/1). Ninety-one of these Panzerjägers were produced by May 1943, eighty-nine of which were committed to the Kursk operation. The Panzerwaffe placed great value on the new second generation of tank destroyers, and much was expected of them during the last years of the war. The Elefant proved to be an effective and successful machine. German mobile anti-tank weapons acquired a healthy respect in the eyes of the Soviets that came up against them: Russian tank crews engaged them with caution. But production difficulties and lack of fuel were constant sources of problems.

Chapter Five

The End

During the first months of 1944 the Germans continued to endure repeated heavy attacks, but the Red Army found the mass of dug-in defences difficult to break.

In total some 20,000 German fighting vehicles, including 8,328 medium and heavy tanks, 5,751 assault guns, 3,617 tank destroyers and 1,246 self-propelled artillery carriages of various types, reached the Eastern Front. Included in these new arrivals were the second generation of tank-destroyers. In fact, tank-destroyers and assault guns would soon outnumber the tanks, which was confirmation of the Panzerwaffe's importance. But they were stretched along such a thin Eastern Front that they rarely reached their full operating potential.

Russian armour continued to be a constant problem for the PaK and Panzerjäger battalions, and the need for more anti-tank support had become desperate. The Germans hastily assembled their next generation tank destroyers and self-propelled artillery vehicles and transported them to the Eastern Front.

The Jagdpanzer IV made its debut in 1944 and was based on the Pz.Kpfw.IV chassis. It was turretless and constructed in three variants. The first was known as the Jagdpanzer IV 0-Serie and was armed with the 7.5cm PaK 39 L/43. The second variant was the Jagdpanzer IV Sd.Kfz.162, armed with the 7.5cm PaK 39 L/48. Its official designation was the Sturmgeschütz neuer Art mit 7.5cm PaK L/48 auf Fahrgestell PzKpfw.IV. A total of 800 were produced in 1944. The last, and the most popular, variant was the IV, armed with a punchy PaK 42 L/70 cannon and named the Panzerjäger IV/70. A total of 940 of these vehicles entered service between August 1944 and April 1945.

Another tank destroyer to make its debut in 1944 was the Jagdpanther, or hunting Panther. The vehicle boasted the lethal 8.8cm KwK 43 cannon which was originally fitted on the new Tiger II and mounted on a Panther chassis. The Jagdpanthers served in the heavy anti-tank battalions (schwere Panzerjäger-Abteilung), and operated mainly in Russia.

The success of the Jagdpanther, though limited in numbers, prompted the introduction of the Jagdtiger. The Panzerjäger Tiger Ausf.B was based on a lengthened Tiger II chassis, and at 71-tonne it was the heaviest fighting vehicle of the war. This

tank destroyer boasted a massive 12.8cm PaK 44 L/55 cannon. Just seventy-eight were ever produced and saw limited action on both the Eastern and Western Front.

Despite these additions to the force, it became increasingly obvious during 1944 that both the PaK and Panzerjäger units confronting Soviet armour were becoming less effective. The Russians had developed newer and larger anti-tank weaponry of their own with greater armoured protection and adequate firepower to deal with the German arsenal. The Russians were continuing to push the Germans back.

To help deal with Soviet and Allied armour, German infantry, especially Panzergrenadiers, were supplied with the new hand-held personnel anti-tank rocket launcher, the Panzerfaust (tank fist). This was an inexpensive, single shot, recoilless weapon comprising a small, disposable preloaded launch tube which fired a high explosive warhead. The Panzerfaust was first introduced during 1943, but by mid-1944 thousands were being mass-produced. The Panzerfaust 30 was the first to enter production. It had a loaded weight of 5.1kg and was 104.5cm long. The launch tube was made of low-grade steel and the propellant was black powder. Along the side of the tube was a simple folding rear sight and a trigger. The edge of the warhead was used as the front sight and the user would aim the weapon at his target holding it in the crook of the arm. He would then pull the trigger and the warhead would be released, hopefully penetrating the enemy armour. The Panzerfaust had an impressive penetration capability, comparing favourably to the American-made bazooka or the British-made PIAT. On impact it produced a powerful explosion which would create a small hole in thick armour. The blast which entered the tank was quite capable of killing the entire crew inside the vehicle.

For nearly two years, variations of the Panzerfaust were produced. Following the 30 model was the Panzerfaust 60, which was the most common and widely used weapon of its kind, completed in early 1944. It did not reach full production until September 1944, when 400,000 were to be produced each month. It had a better range than the 30 and had an improved flip-up rear sight and trigger mechanism. The Panzerfaust 100 was produced in quantity from September to November 1944. The next production model, Panzerfaust 150, was a major redesign, but was produced in limited numbers near the end of the war. The firing tube was reinforced and reusable for up to ten shots. A new pointed warhead with increased armour penetration and two-stage propellant ignition gave a higher velocity. Production did not start until March 1945, weeks before the end of the war. The last Panzerfaust to be designed was the 250, but this was not to be ready until September 1945.

Another anti-tank weapon that the German infantry used, but was not as widely distributed as the Panzerfaust, was the Panzerschreck or 'tank shock'. This reusable anti-tank rocket launcher was based on the American bazooka, but was larger and heavier than its American counterpart. The Panzerschreck had an impressive 8.8cm calibre, compared to the 6.0cm calibre of the bazooka. This meant it could penetrate

thicker armour, using an existing Raketenpanzerbüchse (RPzB – rocket tank rifle). Gr.4312 designed for the 8.8cm Raketenwerfer (rocket projector) 43. The weapon was shoulder-launched, firing a fin-stabilized rocket with a shaped charge warhead. It was disposable and recoilless like the Panzerfaust. Users were instructed to wear protective gloves, a poncho and a gas mask without a filter. This was to shield the user from the heat of the back blast when the weapon was fired. Later, improvised shields were made to protect the user, and in February 1944 the RPzB 54 was fitted with an official blast shield to protect the operator which made the weapon heavier.

One downside of the Panzerschreck was that it produced a lot of smoke from the back-blast – it soon earned a nickname of the 'stove pipe' or *Ofenrohr*. The main problem with this was that it gave away the user's position. Consequently, anti-tank teams had to be constantly on the move.

Later in the war the Germans began tactically deploying Panzerschreck and Panzerfaust teams into staggered trenches no further than 115m apart. In this way, attacking enemy armour would be confronted by lines of anti-tank fire from multiple directions at a distance of no more than 69m.

In total, some 290,000 launchers of all variants were manufactured, along with over 2 million rockets. This was an impressive amount of anti-tank weaponry for the German infantryman. But the Russians had too many tanks and German anti-tank crews remained incapable of causing any serious losses or delay to them. As for the new generation of tank hunters – the Jagdtiger, Jagdpanther and Hetzer – whose responsibility it was to repel the huge numbers of enemy vehicles, crews often found themselves outnumbered and exposed to anti-tank fire.

German mobile anti-tank weapons had earned a healthy respect on the battlefield, and Russian tank crews engaged them with caution. But by this stage of the war, production difficulties and the lack of fuel caused never-ending problems. As a result the Russians continued pushing forward while German forces retreated through Poland to East Prussia and then into the Reich itself.

During the last weeks of the war most of the remaining PaK crews, Panzerfaust, Panzerschrek teams and tank hunters continued to fight and defend, holding back the vast tide of enemy vehicles. But they were an overstretched army fighting an overwhelming enemy. Eventually, they were either destroyed or surrendered. But nobody could deny that the anti-tank crews had won a heroic reputation for daring and professionalism in combat.

(**Opposite, above**) A group of anti-tank gunners armed with the deadly Panzerfaust slung over their shoulder prepare to move out on an operation in early January 1945. By this late period of the war large numbers of Panzerfaust were issued to front line troops in a radical attempt to stem the enemy onslaught into Germany.

(**Opposite, below**) During operations on the Western Front in Belgium, following the defeat of the German Ardennes offensive in January 1945, here in this photograph is a knocked-out 7.5cm PaK 40 with one of the dead anti-tank gunners still lying sprawled out in the snow.

(**Above**) A smiling young grenadier on the way to the front armed with a Panzerfaust. Along the German front lines was a mixture of troops, with mortar emplacements, tanks, PaK and FlaK guns. Behind these defensive positions at varying depths were anti-tank defences, including mortars, Panzerschreck, Panzerfaust, 7.5cm and 8.8cm PaK guns, ready to counter any enemy armoured vehicle that managed to break through. However, while it appeared that the Germans were prepared for attack, equipment employed along the defensive belts was too thinly spread. Commanders were unable to predict exactly where the strategic focal point of an enemy attack would take place.


SMG

(**Opposite**) In a defensive position on the Eastern Front is an MG42 machine gunner lying in wait for the advance of the enemy. He has three Panzerfaust lined up waiting for enemy armour to appear.

(**Above**) Along a trench and these Waffen-SS grenadiers armed with the Panzerfaust are taking cover during an attack. When enemy armour approached these troops would emerge from their trench and fire their weapon, discarding the body and withdrawing to another position, often using another Panzerfaust again.


RMun

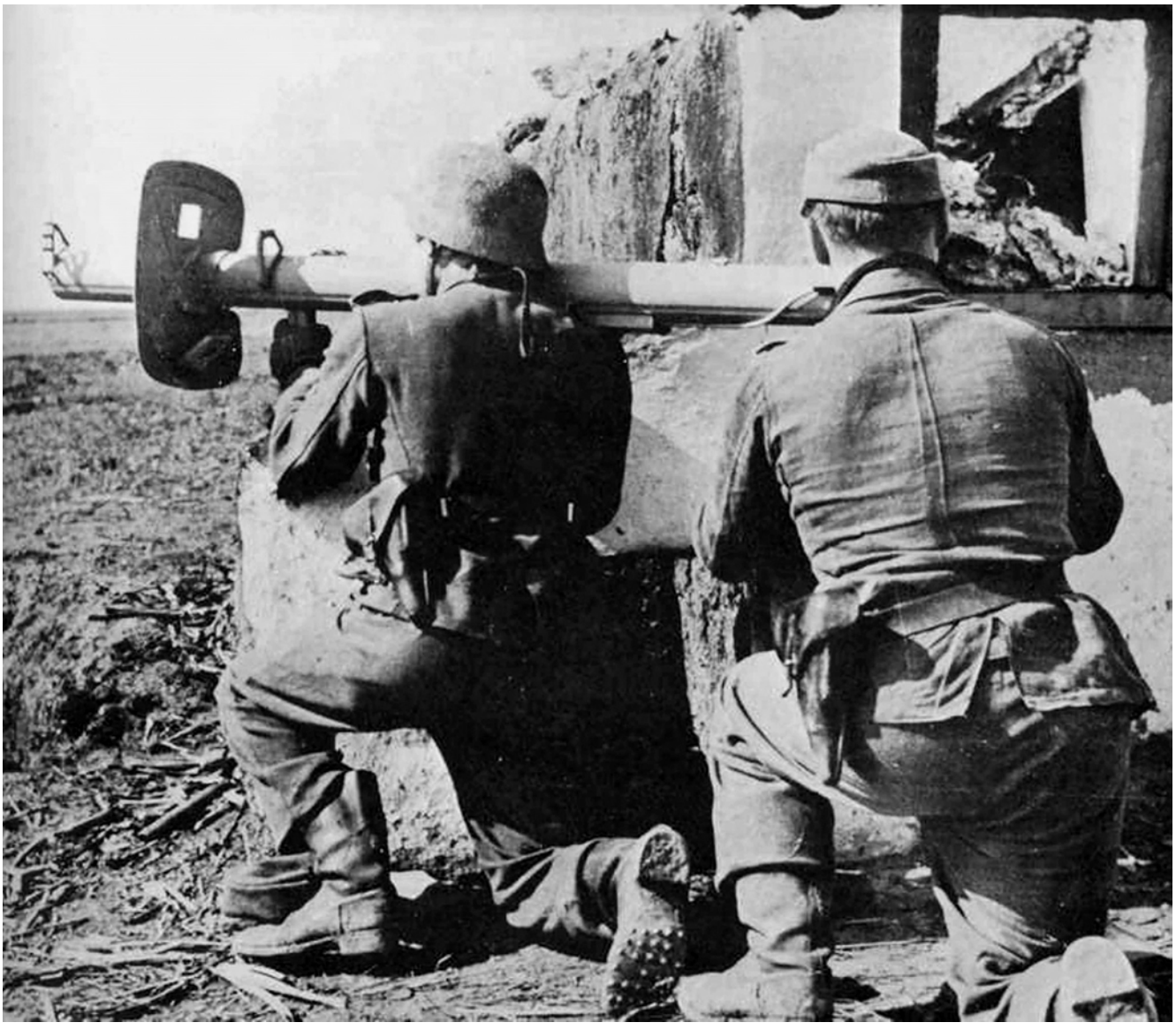
(**Opposite, above**) Fallschirmjäger (paratroopers) can be seen manhandling this 7.5cm PaK 40 during operations on the Eastern Front in February 1945. By this period of the war the PaK gun had been issued to all armed forces.

(**Opposite, below**) An interesting photograph showing a Panzerschreck being prepared for action. By 1945 there was a dramatic increase in the loss of Russian tanks to the Panzerfaust and more than half of the tanks knocked out in combat were destroyed by Panzerfausts or Panzerschrecks.

(**Above**) A number of grenadiers, four of which are armed with the Panzerschreck are disembarking from an infantry lorry inside a village on the Western Front in 1944. This weapon was first issued in 1943 to units on the Eastern Front and remained on issue for the remainder of the war. As the propellant situation became more critical, other weapons were developed to replace it, but few reached the hands of the troops, so in spite of this logistic drawback it stayed in use. The weapon was highly effective against enemy armour, and was well liked among the soldiers that used it.

Three photographs showing an anti-tank grenadier hidden in the undergrowth with an 8.8cm RPzB 54 anti-tank rocket launcher, known as the Panzerschreck.

During a fire mission and this Panzerschreck is being reloaded with a projectile for an attack against a target. Although this anti-tank weapon was very effective on the battlefield, firing it generated a lot of smoke both in front and behind. This could give away the firer's position, making him a target. This often meant moving quickly from one position to another after firing.



(**Above**) A Panzerschreck team comprising the firer and the loader during defensive operations on the Eastern Front late in the war. As the war became increasingly desperate special Panzerschreck and Panzerfaust teams were set up in staggered trenches no further than 115m apart. This was done to attack enemy armour from multiple directions at a distance of no more than 69m. Anti-tank teams were instructed to aim for the thinner side or rear armour whenever possible.

(**Opposite**) On the front and these grenadiers can be seen sitting in a slit trench during a lull in the fighting. Behind them is a stationary Sd.Kfz.251/10 which has been modified and mounts the 3.7cm PaK 35/36 anti-tank gun. By replacing the front machine gun with this light anti-tank gun, Panzergrenadier units could rely on good fire support and be able to deal with some lighter enemy tanks as they charged across the battlefield.

(**Above**) In front of a group of officers an Unteroffizier demonstrates how the shaped-charge warhead fits into the launch tube of a Panzerfaust 30. The propellant charge is packed into the launcher tube.

(**Opposite**) Grenadiers advancing along a ditch by the side of a road armed with the Panzerfaust. The Panzerfaust remained in service in various versions until the end of the war.

(**Below**) Two grenadiers converse behind a stationary Sd.Kfz.251 halftrack armed with the Panzerfaust.

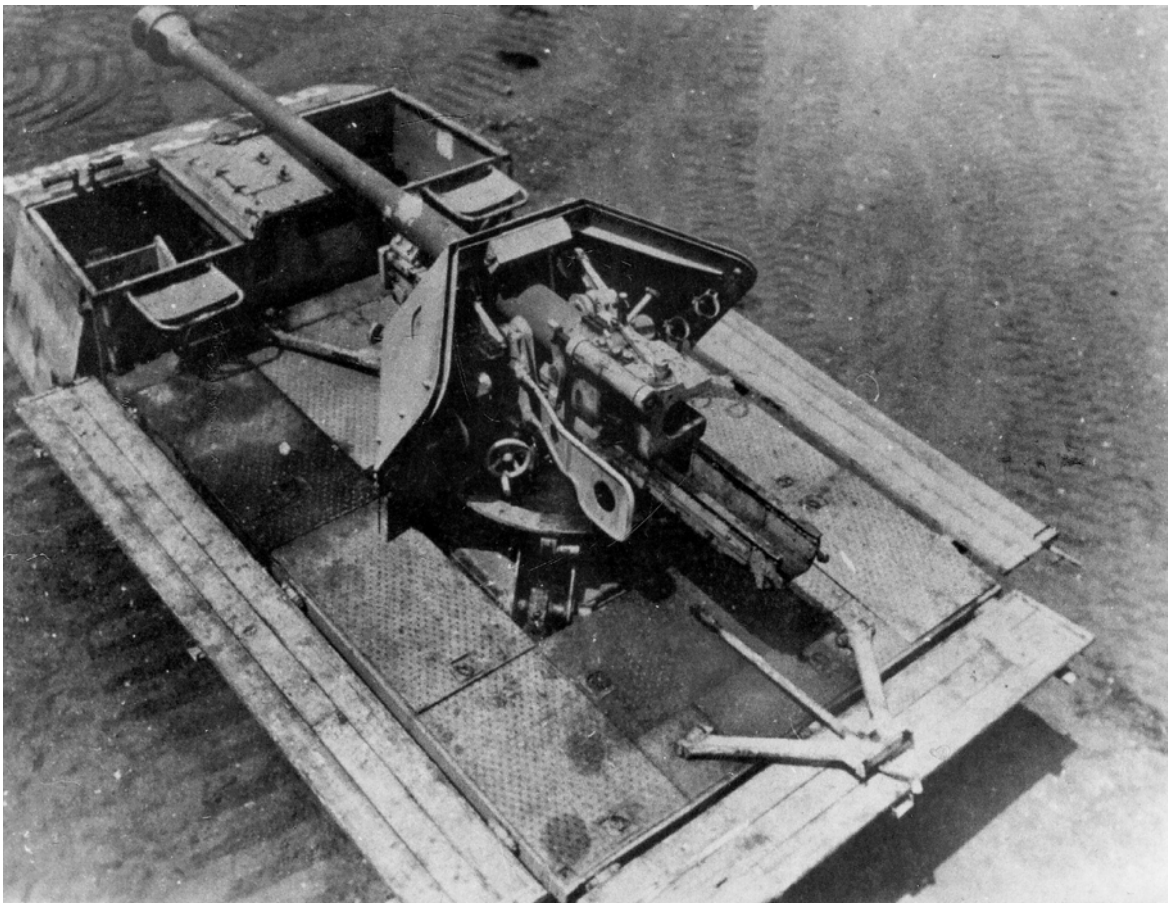
A grenadier armed with the Panzerfaust is about to fire the weapon for a propaganda photograph. There was a simple folding rear sight and a trigger on the side of the tube for firing the weapon. The edge of the warhead was used as the front sight. The oversize warhead was fitted into the front of the tube by an attached wooden tail stem with metal stabilizing fins. The warhead weighed 2.9kg and contained 0.8kg of a 50:50 mixture of TNT and hexogen. It was capable of penetrating 200mm of armour.

(**Opposite, above**) An interesting photograph of SS-Reichsführer Heinrich Himmler on the right being shown by an SS officer and a grenadier the procedure for loading the Panzerschreck. In early 1945 Himmler was commander of Army Group Vistula which was intended to halt the Soviet Army's Vistula-Oder offensive into Pomerania. It was quickly realised that the Reichsführer was totally incompetent as an army group commander and as a consequence he was relieved of his command on 20 March 1945, being replaced by General Gotthard Heinrici.

(**Opposite, below**) A commanding officer training grenadiers in the use of the Panzerfaust during the last months of the war. The warhead has been placed in the tube ready for firing and the officer is showing the men the crude aiming device that was fitted onto the weapon.

A soldier armed with the Panzerfaust. It was common practice to be armed with more than one Panzerfaust as these weapons were disposable. During the last year of the war the Panzerfaust was used extensively to combat both Russian and Allied armour. This handheld rocket-propelled grenade was effective at a range of approximately 90ft. It was very light because the launch tube was made of thin low-grade steel. The propellant for the missile consisted of only 95g of black powder. The weapon became very useful against enemy tanks during the last months of the war. Some tank units even waited for infantry support before advancing to minimize the risk of being knocked out. The high kill rate by the Panzerfaust, however, is attributable mainly to the lack of German anti-tank guns late in the war and also the terrain where the fighting took place.

(**Opposite**) Two photographs showing what was called the RSO/PaK 40. These anti-tank vehicles consisted of a PaK 40 anti-tank gun mounted on the chassis of a RSO caterpillar tractor. The suspension of the RSO remained unchanged but the front driver's compartment was replaced with a low, lightly armoured superstructure making the vehicle very lightweight and cheap to produce. Surprisingly, this RSO/PaK 40 anti-tank vehicle became a highly mobile infantry anti-tank weapon. However it was more exposed than the conventional, open-topped tank destroyers and as a result many were lost in action. Note in this photograph that while in action some or all the upper panels could be folded down to allow additional room for the PaK crew. From late 1944, some 23,000 RSOs of all versions were produced. Although the vehicle was intended for use by infantry anti-tank units, when the RSOs first left the factory they were immediately issued to armoured units due to the massive losses sustained on the Eastern Front.

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(**Opposite, above**) Allied troops survey the damage to a vehicle. In the background is an abandoned Marder III, the fuel can next to the Panzerjäger indicating this vehicle more than likely ran out fuel. This anti-tank vehicle proved to be a very effective improvisation that married two powerful anti-tank guns with a platform to provide Wehrmacht, Waffen-SS and Luftwaffe troops with good mobile anti-tank capability. However, it did have its drawbacks. The upper structure mounted the gun and an extended gun shield only gave limited protection for the crew, so losses were high. Armour protection ranged from 10 to 50mm with no armour at all above and behind the gun compartment.

(**Opposite, below**) A knocked-out Sd.Kfz.251/22. This 'Pakwagen' was regarded as one of the best support vehicles during the war, in spite of its problems. Mounted in the compartment of this standard halftrack personnel carrier was a high velocity 7.5cm PaK 40. These vehicles were extensively used, especially during defensive actions in 1944/5. However, the halftrack was never designed to carry a gun of this size, and due to its weight it often caused the engine to overheat. The blast shock and recoil also strained the vehicle's superstructure.

(**Above**) This photograph depicts the battle of Berlin in April 1945. It shows anti-tank grenadiers preparing a typical defensive position inside the city. A Panzerschreck can be seen at the ready. Berlin, however, was almost defenceless against the Red Army. Despite giving the Volkssturm the main task of defending the city, which was supported by a motley collection of Hitlerjugend, Wehrmacht, Luftwaffe and Waffen-SS troops, supplies in both weapons and ammunition were desperately low. Those fortunate enough to be armed with either a Panzerschreck or Panzerfaust stood more of a chance.

Appendix I

Popular Towed Anti-Tank Guns

PaK 36 (Panzerabwehrkanone 36)
This 3.7cm anti-tank weapon of the Panzerjäger units was a very popular weapon and used until 1942. It was developed by Rheinmetall in 1933 and was first issued to the German army in 1936. By 1939 some 9,120 had been produced and thereafter a further 5,339 were manufactured.

PaK 38 (L/60) (5cm Panzerabwehrkanone 38 (L/60))
This 5cm anti-tank gun was developed in 1938 by Rheinmetall-Borsig AG as a successor to the 3.7cm PaK 36. The PaK 38 was first used by both Wehrmacht and Waffen-SS units in April 1941. During the invasion of the Soviet Union in 1941 when the Germans faced Soviet tanks, the 38 was one of the few early guns capable of penetrating the 45mm (1.8in) sloped armour of the T-34 hull at close range. The gun was also equipped with Panzergranate 40 APCR shots with hard tungsten core, used against heavier Russian armour such as the KV-1 tank.

PaK 97/38 (7.5cm Panzerabwehrkanone 97/38 and
7.5cm Panzerjägerkanone 97/38)
This 7.5cm anti-tank gun was a combination of the barrel from a captured French Canon de 75 modèle 1897 fitted with a Swiss Solothurn muzzle brake and mounted on the carriage of the German 5cm PaK 38. These anti-tank guns were used on the Eastern Front mainly between 1941 and 1942. The gun was light and had good mobility, and sufficient armour-penetrating performance to pierce the T-34 and KV tanks in many situations.

PaK 40 (7.5cm Panzerabwehrkanone 40)
This 7.5cm anti-tank gun was developed between 1939 and 1941 by Rheinmetall. Some 23,303 of these weapons were produced, and it became the backbone of German anti-tank gun capability for the later part of the war. Some were converted for use on vehicles to become tank destroyers, such as the Marder series. These Kampfwagenkanone came in two versions: the 7.5/L43 or 7.5/L48.

PaK 43 (Panzerabwehrkanone 43 and Panzerjägerkanone 43)
This powerful and deadly 8.8cm-calibre anti-tank gun was developed by Krupp in direct competition with the Rheinmetall 8.8cm FlaK 41 anti-aircraft gun. The PaK 43

was mass produced and so successful it was also modified later in the war to be fitted to the Panzerjäger Tiger II, Nashorn, Elefant and Jagdpanther tank destroyers. The improved 8.8cm was fitted with a semi-automatic vertical breech mechanism that reduced recoil. The weapon could also be fired electrically while on its wheels. Gunners found that because the weapon had a very flat trajectory it was easier to hit targets at longer ranges as fewer corrections in elevation were required. The gun had excellent penetration and could pierce the frontal armour of any Allied tank even at long ranges. It could often defeat the Soviet IS-2 tank and IS chassis-based tank destroyers.

Appendix II

Converted Anti-Tank Guns

Panzerjäger I (4.7cm PaK on Pz.Kpfw.I chassis)
The Panzerjäger I saw its debut on the Western Front in 1940 during the French campaign. These vehicles were used by independent anti-tank battalions. In total five Panzerjäger companies were equipped with a 4.7cm PaK auf Pz.Kpfw.I.

Marder I (7.5cm PaK on captured French chassis, the Lorraine 37L)
The Panzerjäger Marder I Sd.Kfz.135 was modified with the 7.5cm PaK gun. Most of the Marder Is were mounted on the base of the Tracteur Blinde 37L (Lorraine) French artillery armoured personnel carrier of which the Germans captured three hundred following the capitulation of France in June 1940. The vehicle is distinguishable from the Marder family by its distinctive French wheel arrangement. As with the other Marders it mounted a high box-like thinly-armoured open-topped superstructure that sloped to the rear. The 7.5cm PaK 40 anti-tank gun was mounted with its front shield fitted directly over this superstructure frame. The long overhanging cannon also required a gun cradle bolted to the front hull.

Marder II (7.5cm PaK, or from captured Soviet 76.2mm gun on Pz.kpfw II chassis)
This was based on the chassis of the Pz.Kpfw.II. There were two versions, the first mounted modified Soviet 7.62cm guns firing German ammunition, and the second mounted the powerful German 7.5cm PaK 40 gun. As with all Marders, it was designed with a high-profile and had open-topped armour with minimal protection for the crew.

Marder III (7.5cm PaK, or reused Soviet 76.2mm gun on Czech-built Pz.Kpfw.38(t) chassis)
This vehicle mounted either Soviet 76.2mm F-22 Model 1936 divisional field guns, or the German 7.5cm PaK 40, in an open-topped cupola on top of the chassis of the Pz.Kpfw.38(t). While it offered little protection to the crew, it added significant firepower. However, the Marder series was not fully armoured, and so was just an interim solution to the growing threat of heavier Russian armour. Basically the Marder was more of a gun carriage than a proper Panzerjäger that could exchange shells with enemy tanks. Nevertheless, they undertook sterling service for the Wehrmacht and Waffen-SS.

Hornisse/Nashorn (Nashorn 8.8cm PaK 43 (L/71) Panzerkampfwagen III/IV (Sd.Kfz.164))
The Nashorn looked similar to the Hummel (bumblebee), but unlike the Hummel this light turretless vehicle mounted a lethal PaK 43 heavy anti-tank gun on the chassis of either a Pz.Kpfw.III or a Pz.Kpfw.IV. The Nashorn entered production in early 1943, and during a period of transformation it was given numerous official designations, such as 8.8cm PaK 43 (L/71) auf Fahrgestell Panzerkampfwagen III/IV (Sf) or 8.8cm PaK 43 (L/71) auf Geschützwagen III/IV (Sd.Kfz.164); it was also designated as a Panzerjäger Hornisse (hornet).

Elefant (Panzerjäger Tiger (P) Elefant)
This vehicle was fitted with the powerful 8.8cm Panzerjägerkanone 43/2 gun (early designation 8.8cm StuK 43/1). The long punchy gun had originally been developed as a replacement for the famous 8.8 FlaK, but turned into a very successful mobile PaK 43 anti-tank gun. The Elefant was a heavy tank destroyer like no other during this time. It was built in small numbers under the name Ferdinand after its designer Ferdinand Porsche, using tank hulls that had been produced for the mighty Tiger I.

Jagdpanzer 38(t) Hetzer
This vehicle mounted the 7.5cm PaK 39 L/48 gun, which was a modified version of the 7.5cm StuK 40 L/48 and mounted on the Sturmgeschütz III/IV assault guns. These Panzerjäger were more than capable of destroying any Allied or Soviet tank. Unlike the Marder series where the fighting compartment was open, the Hetzer ('agitator') had fully enclosed armour for additional crew protection. These vehicles became one of the most common armoured vehicles in the later war period.

Jagdpanther
The Jagdpanther boasted the lethal 8.8cm KwK 43 cannon which was originally fitted to the new Tiger II and mounted on a Panther chassis. This unturreted tank destroyer had thick armoured sloped hull sides, and inside the hull was a roomy interior. For local defence it was armed with an MG34 machine gun fitted in a ball mount on the right side of the front glacis plate. There were two main variants manufactured, the first was the 1944 G1 model with a small internally bolted main gun mantlet and a modified Panther A engine deck. The later variant, built later in 1944, was known as the G2; it had a larger outside-bolted mantlet and a modified Panther G engine deck.

Jagdpanzer IV
This Panzerjäger, designated as the Jagdpanzer IV A-O, mounted the 7.5cm 42 L/70 gun on an unmodified Pz.Kpfw.IV chassis but with wide tracks. There was another modification of this vehicle which included the pot mantlet. This tank destroyer, also known as the Panzerjäger IV, mounted virtually the same cannon as the Pz.Kpfw.IV. The vehicle carried seventy-nine rounds, had a low-profile silhouette, and was a lethal

component on the battlefield. The Jagdpanzer IV served in the anti-tank sections of both Panzer and SS Panzer divisions.

Jagdtiger

The Panzerjäger Tiger Ausf.B was based on a lengthened Tiger II chassis, and at 71 tonnes it was the heaviest fighting vehicle of the war. This tank destroyer boasted a massive 12.8cm PaK 44 L/55 cannon. However, it was so heavy and incurred so many mechanical problems that it often failed to reach the front lines. Approximately seventy-eight were produced, seeing limited action on both eastern and western fronts. Only two heavy anti-tank battalions, 512 and 653, were equipped with Jagdtigers. They arrived at the front in September 1944, and within days several were either lost in combat or destroyed by their own crews when they developed mechanical problems. Most of these problems, however, were when they ran out of fuel during the last frantic weeks of the war.

Appendix III

Hand-Held Anti-Tank Weapons

Panzerbüchse 39/38 (PzB 38/39)

This weapon was the first hand-held anti-tank weapon in the German arsenal. Their purpose was to provide infantry with a man-portable lightweight anti-tank rifle. It was a manually-loaded single-shot weapon with a recoiling barrel. When fired, the barrel recoiled, which opened the breech and ejected the spent cartridge casing. The breech block was then arrested in the rear position, remaining open for the gunner to manually insert a new cartridge. The gunner then released the cocked breech with a lever at the grip. The breech and barrel would then move forward again and the trigger was cocked in preparation to fire. These rifles were used at company level for anti-tank support with an NCO commanding three teams, each of a gunner and loader serving a single Panzerbüchse 38/39. However, the anti-tank rifle was quite a complicated and antiquated weapon and only effective against the lightest of armoured fighting vehicles.

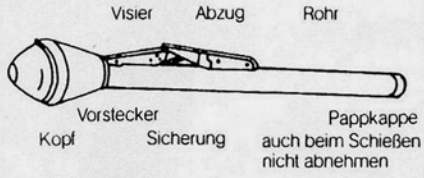
Panzerschreck – Raketenpanzerbüchse 54 (RPzB 54)

This hand-held 8.8.cm reusable anti-tank rocket launcher was nicknamed by the troops the 'Ofenrohr' (stove pipe). The Panzerschreck (tank terror/fear/shock) was designed as a lightweight infantry anti-tank weapon and was an enlarged copy of the American bazooka. It was shoulder-launched and fired a fin-stabilised rocket with a shaped-charge warhead. Although a popular and effective anti-tank weapon, it was produced in smaller numbers than the Panzerfaust.

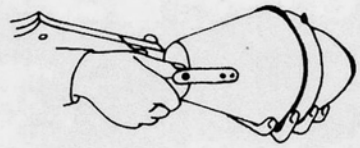
Panzerfaust

This weapon consisted of a small, disposable preloaded launch tube firing an HE anti-tank warhead, and was operated by a single soldier. The Panzerfaust remained in service in various versions until the end of the war. Written in large red letters on the rear end of the tube was a warning of the back blast. There were six versions: Panzerfaust 30 'Kleine' (small), 30, 60, 100, 150 and 250. The 150 was a major redesign and was deployed in limited numbers near the end of the war. The firing tube was reinforced and reusable for up to ten shots. A new pointed warhead with increased armour penetration and two-stage propellant ignition gave a higher missile velocity. The Panzerfaust 250, the last generation disposable anti-tank weapon, consisted of a reloadable tube and featured a pistol grip. However, none went into production.

PANZERFAUST 60



Fertigmachen der Panzerfaust



1. Griff:
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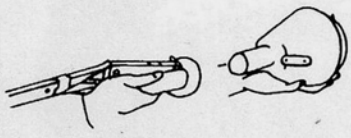
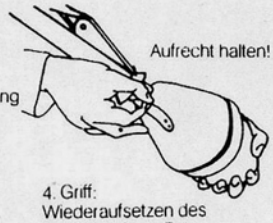
Abnehmen des Kopfes



2. Griff:
Kopf abnehmen

3. Griff:
Zündladung und Zünder
einsetzen



4. Griff:
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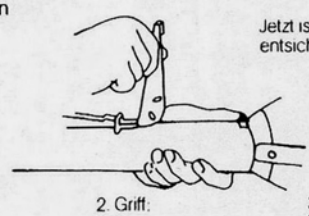
Kopfes auf das Rohr

Vorbereitung zum Schießen

1. Griff:
Vorstecker
herausziehen



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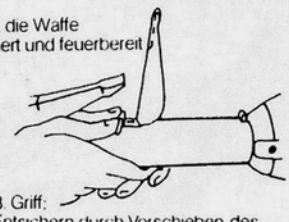
Visier
hochklappen



3. Griff:
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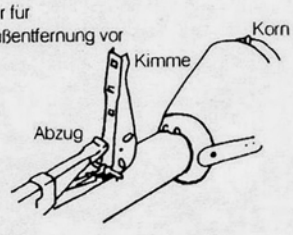
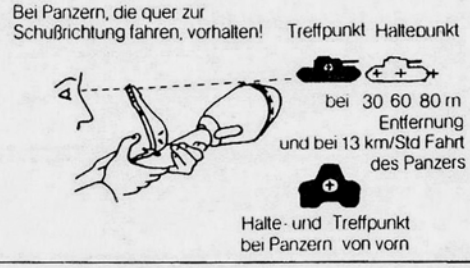
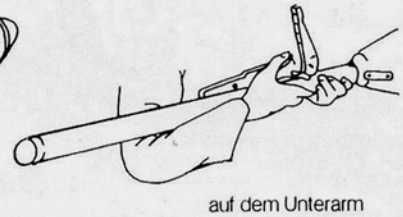
Sicherungsstiftes mit beiden Daumen
bis zum Anschlag





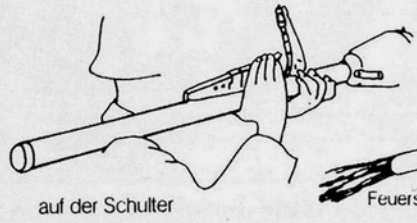
Anschlagarten

unter der Achsel

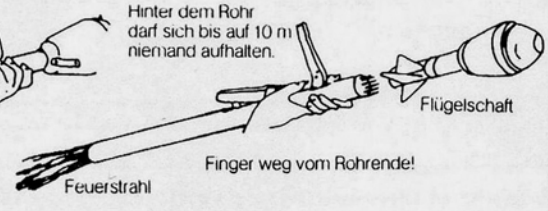


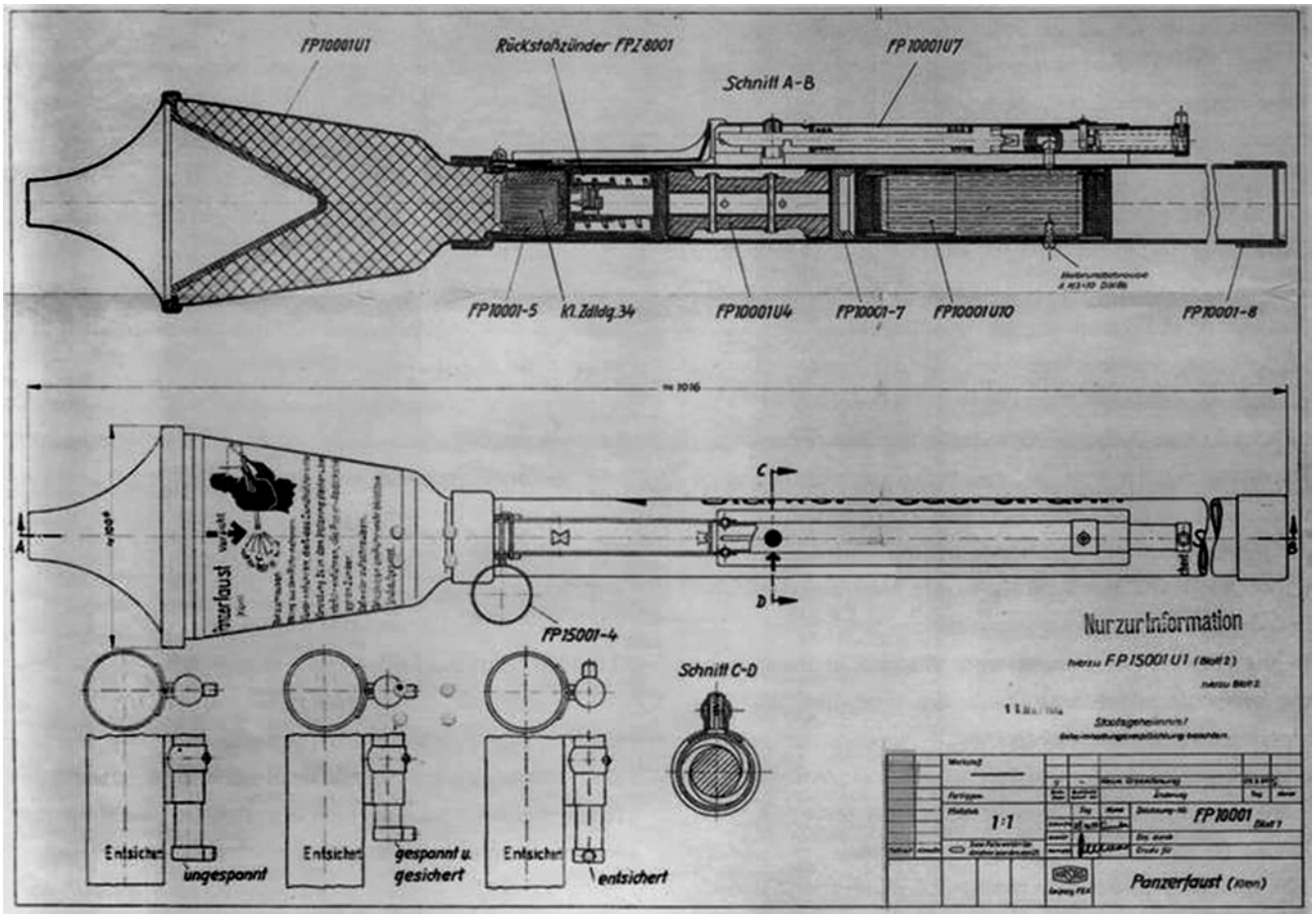
auf dem Unterarm

Abschuß



auf der Schulter





(**Opposite**) This German diagram was distributed to troops who were being trained on how to load, aim and fire the Panzerfaust. The oversize warhead was fitted into the front of the tube by an attached wooden tail stem with metal stabilizing fins. The warhead weighed 2.9kg and contained 800g of a 50:50 mix of TNT and hexogen explosives. It was capable of penetrating armour 200mm thick. There was a crude aimer that flipped up. There were warnings written on it about the back blast. After firing, the tube was discarded, making the Panzerfaust the first disposable anti-tank weapon.

(**Above**) An interesting German blueprint showing the workings and mechanism of the Panzerfaust.

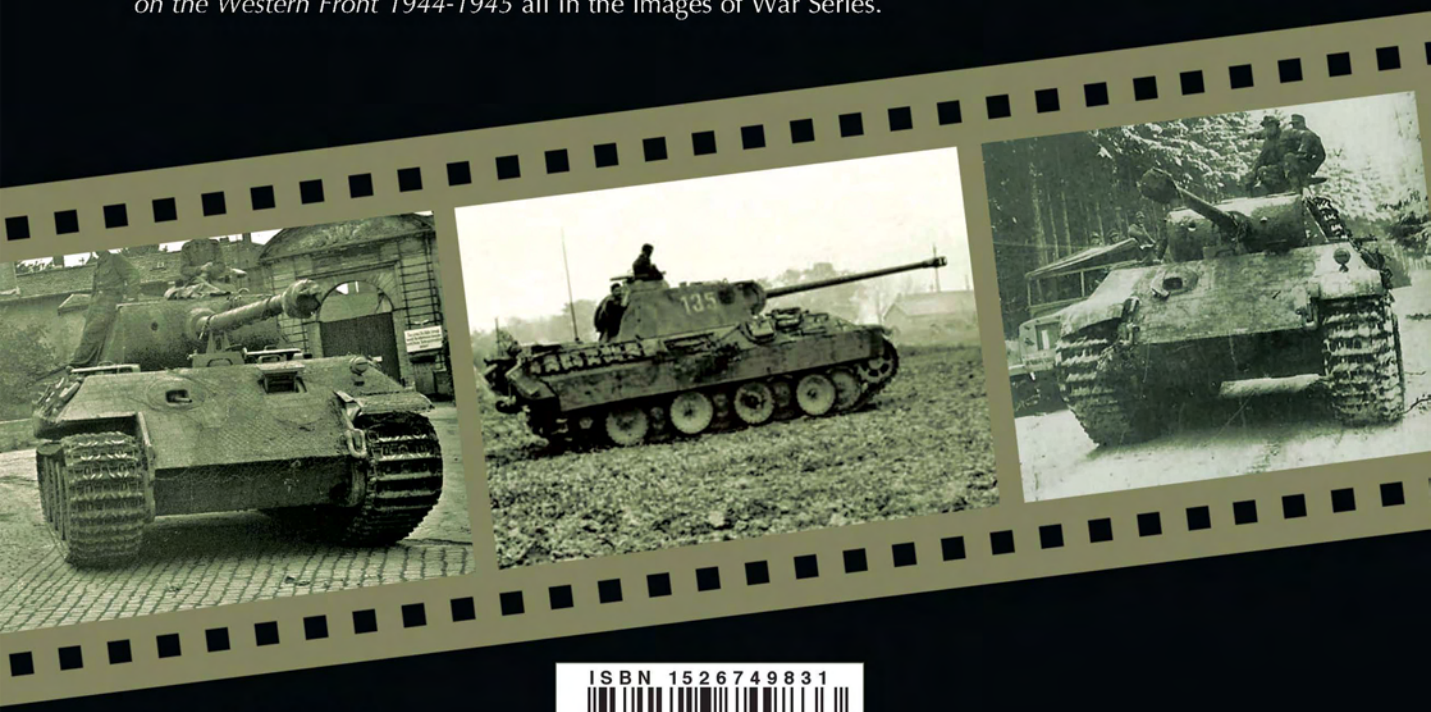
Hitler's Wehrmacht and SS units will be remembered for their aggressive 'Blitzkrieg' tactics. But, as the war progressed, the Germans, recognising the offensive capability of armoured warfare, developed an impressive range of anti-tank warfare weaponry and munitions.

Using many rare unpublished images this Images of War book covers the full Nazi anti-armour capability from the 3.7cm Pak 35, 5cm Pak 38 and 7.5cm Pak 40 to the versatile 8.8cm Flak feared by the Allies. Also featured are the half-tracks and converted Panzers that pulled or mounted these weapons and carried forward observers and reconnaissance elements.

Later hand-held anti-tank weapons came into service and were effective and economic against Allied armour. The Panzer faust, with its shaped charge warhead, became the first disposable anti-tank weapon in history.

This comprehensive book shows this formidable range of weapons in action from Poland in 1939, through North Africa and the Eastern Front to the final collapse in 1945.

Hans Seidler is a leading collector of Second World War memorabilia and an authority on German armed forces and their equipment. His published works with Pen and Sword include *Hitler's Tank Killers – Sturmgeschütz at War 1940 -1945, Luftwaffe Flak Divisions, Hitler's Boy Soldiers* and *Hitler's Defeat on the Western Front 1944-1945* all in the Images of War Series.



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